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LITANI RIVER BASIN MANAGEMENT SUPPORT PROGRAM

FARMER SATISFACTION FOLLOW-UP SURVEY

December 2012
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LIST OF ACRONYMS

GOL	Government of Lebanon
Ii	Information International
IRG	International Resources Group
IQC	Indefinite Quantity Contract (a contracting mechanism for USAID)
LRA	Litani River Authority
LRBMS	Litani River Basin Management Support Program
NGO	Non-Governmental Organization
PMP	Performance Monitoring Plan
USAID	United States Agency for International Development

FOREWORD

The Farmers Satisfaction Survey for the year 2012 was carried out by Information International sal, a research consultancy firm based in Beirut, Lebanon, under subcontract with International Resources Group (IRG), the main contractor under the Litani River Basin Management Support (LRBMS) Program, a USAID- funded program in Lebanon (Contract EPP-I-00-04-00024-00 Task Order No.7) under the Integrated Water and Coastal Resources Management Indefinite Quantity Contract (IQC) II.

The data analysis and reporting were also conducted by Information International sal.

EXECUTIVE SUMMARY

BACKGROUND

The LRMBS Program is a four-year program aimed at improving the quality of water management in the Litani River Basin (South and Central Bekaa). It is undertaken by IRG, in cooperation with LRA, and is funded by USAID. The program began in late 2009 and has four components: Building institutional capacity, Water monitoring, Irrigation management and Risk management.

As part of the implementation of the LRBMS Program, IRG is monitoring progress and achievements through a Performance Monitoring Plan (PMP). The LRBMS PMP uses thirteen indicators, some of which are drawn from the USAID Lebanon Performance Management Plan. One of the selected indicators (from the USAID PMP) is a customer satisfaction survey. This indicator was defined under LRBMS as focusing only on the water users that are directly served by the counterpart agency, the Litani River Authority (LRA), i.e. farmers who annually subscribe to receive irrigation water from the LRA-managed "Canal 900".

In order to assist with monitoring and assessing the LRBMS Program's performance, Information International was contracted by IRG to carry out a client satisfaction and opinion survey, as a follow-on to two previous surveys conducted in 2010 and 2011, in order to increase its understanding of the farmers' practices and evaluate their level of satisfaction with the provided services.

METHODOLOGY

Before conducting the baseline statistical survey in 2010, field investigations familiarized the survey team with the characteristics of the area and farmers. Farmer interviews provided insights on farmers' issues and perception of Canal 900 management by the LRA. The findings were:

1. Management inefficiency: Farmers are negatively affected by the poor management of the Canal 900 distribution network.
2. Mistrust in the LRA-farmer relationship: Communications are limited and biased.
3. Short irrigation season: Canal 900 operates only in May-October, while rains sometimes do not occur in April and November (and crops are also grown in winter).
4. Pollution issue: Poor water quality impacts crop quality and equipment.

The survey team then identified five research topics:

1. Identify and prioritize public perception of water-related problems affecting them.
2. Assess interest/willingness to be engaged in solving water-related issues.
3. Assess relationship with LRA and other governmental agencies.
4. Identify farmer decision making regarding irrigation water source (groundwater or surface).
5. Assess farmer satisfaction with irrigation services provided by the LRA.

A simple and focused questionnaire was then developed to address these five research themes. The size of the survey sample was set at 50, as a compromise between the need to have a representative sample, which requires a minimum size of 20-30 farmers; and total number of farmers in the area (200 to 300, out of which 100 or so are subscribed).

The survey was already carried out in 2010 and a follow-up in 2011 (see reports).

2012 SURVEY

The collection of information for the full scope of the second follow-up survey in 2012's study was achieved through conducting face to face interviews with a sample of 50 farmers (out of a total of around 250 farmers, out of whom 156 are subscribed with LRA) in six villages in the Bekaa area in Lebanon: Qaraoun, Baaloul, Lala, Joub Janine, Saghbine and Kamed Loz. The same questionnaire developed for the 2011 survey was adopted. The same sample size of farmers, as per the 2011 survey, was adopted as follows:

- 42 farmers were selected from the LRA subscription list provided by IRG (156 subscribed farmers, including 6 females), based on a proportionate sample with regards to number of farmers in each of the related villages, holding size and geographic area.
- 8 non subscribed farmers were also included in the sample.

The field work was conducted between November 21, 2012 and December 1, 2012.

MAIN SURVEY FINDINGS

The main findings of the survey can be summarized as follows:

Farmers' Perception of Water Issues: Pollution ranks first (36%) on the list of water issues faced by the interviewed farmers, followed by the insufficiency of the water quantity. Treating water related problems is the LRA's responsibility (62%) in the first place, while a better cooperation between the farmers and the LRA is less valued as a way of treating water related problems. The Canal 900 delivery network is strong to some framers (36%) and frail for others (36%), and farmers believe they have the expertise to solve water-related problems by themselves.

Farmers' Willingness to solve water issues: The majority of farmers are not willing to compromise for the sake of one another and some do not even believe in the existence of a farmers' cooperative. On the other hand, 73.8% of the farmers are willing to pay an extra amount of money if the LRA was willing to give irrigation out of the regular times when the rainfall is scarce.

Relationships with and awareness of roles of the LRA and other GOL Agencies: The interaction of farmers and the LRA seems to be deteriorating: 60% of interviewed farmers never receive advice from the LRA, and farmers usually meet with LRA staff only when they pay their annual fees or when the need arises. A negative view of the role of agricultural cooperatives, agricultural regional centers, Water Users' Associations (WUAs) and other related organizations is also expressed by the surveyed farmers who view the former as extremely inactive. The majority of farmers expect the Ministry of Agriculture and related agencies to handle the extension services, while the handling of the water distribution at the system and plot level should be handled mainly by the LRA.

Farmers' Choice of Irrigation System: Drippers and sprinklers are the most used types of irrigation. However, a small percent (8%) still use the flooding technique. The main factor that guides the farmers' choice in irrigation type is its suitability for the type of crops.

Canal 900 water pricing system: Canal 900 water is fairly priced. Note that the pricing system is based on an annual flat rate per piece of land (usually the Dunum). Such a pricing system does not account for water metering, which is a pertinent indicator for the efficiency of the irrigation system.
In addition, Canal 900 water is also more available and cost effective to the surveyed farmers, but still polluted, and the amount/quantity delivered is not sufficient.

Farmers' Satisfaction with LRA Services: the level of satisfaction in 2012 (43%) is back to the 2010 level (46 %) after the peak of 2011 (69%). The main motive of dissatisfaction in 2012 is most probably the late start of Canal operations (mid-May) due to a worker strike at LRA. Conversely in 2011, the high level of satisfaction was probably due to an external factor that is late rains (until mid-May). There was thus no shortage of water, as usually happens on regular years between end of the rainy season (early April) and the start of Canal operations (often mid to end April).

ملخص تنفيذي

الخلفية

ان برنامج دعم ادارة حوض الليطاني المعروف بـــ LRBMS يمتد لاربعة اعوام ويهدف إلى تطوير ادارة المياه في حوض نهر الليطاني في البقاع. تنفذ هذا المشروع شركة IRG، بالتعاون مع المصلحة الوطنية لنهر الليطاني، وهو ممول من قبل الوكالة الامريكية للتنمية الدولية الـــ USAID . بدأ العمل في هذا البرنامج في العام ٢٠٠٩ ويحتوي على اربعة اجزاء: بناء القدرات، مراقبة المياه، ادارة مشاريع الري وادارة المخاطر.

قامت شركة IRG بمراقبة تقدم وتطور النتائج من خلال خطة مراقبة الاداء المعتمدة وذلك كجزء من البرنامج التنفيذي لـــ LRBMS . إن خطة مراقبة الاداء المنفذة من قبل الـــ LRBMS اعتمدت على ثلاثة عشر مؤشر، بعض من هذه المؤشرات يعتمدها مخطط ادارة الاداء في الـــ USAID لبنان، واحد من هذه المؤشرات هو استقصاء مدى رضى الشركاء في العمل. اعتمد برنامج الـــ LRBMS هذا المؤشر الذي يركز على مستخدمي المياه ومدى رضاهم عن تقديمات المصلحة الوطنية لنهر الليطاني من خلال مشروع ري البقاع الجنوبي المعروف بمشروع القناة ٩٠٠.

من اجل المساعدة في رصد وتقييم اداء الـــ LRBMS، قامت شركة IRG بالتعاقد مع الشركة الدولية للمعلومات من اجل دراسة ممارسات المزارعين وتقييم مستوى الرضا عن الخدمات المقدمة من المصلحة الوطنية لنهر الليطاني. هذه الدراسة هي الثالثة بعد الدراستين الاساسية والثانية اللتين نفذتا في العامين ٢٠١٠ و ٢٠١١.

طريقة المسح

قبل اجراء المسح الاحصائي، قام الفريق المختص بالتعرف إلى المنطقة وعلى المزارعين. قدمت المقابلات مع المزارعين رؤيتهم الواضحة لادارة مشروع ري القناة ٩٠٠ وكانت النتائج على الشكل التالي:

١ -عدم الكفاءة الادارية: ابدى المزارعون امتعاضهم من الطريقة التي تدار فيها شبكة الري؛
٢ -عدم الثقة ما بين المصلحة الوطنية لنهر الليطاني والمزارعين: تقتصر الاتصالات على بعض الاشخاص وهي محدودة جدًا؛

٣ - الفترة الزمنية القصيرة للري: تعمل القناة ٩٠٠ من ايار إلى تشرين الاول، حيث تتوقف الامطار احياناً من شهر نيسان إلى تشرين الثاني ما يؤدي خلل في عملية الري؛
٤ - قضية التلوث: نوعية المياه السيئة تؤثر على نوعية المحاصيل وعلى المعدات المستخدمة.

قام فريق المسح بتحديد خمسة مواضيع بحثية على الشكل التالي:

١ - وضع اولويات وتحديد مشاكل المياه التي تؤثر على المزارعين؛
٢ - تقييم الفائدة الرغبة في المشاركة في حل المسائل المتعلقة بالمياه؛
٣ - تقييم العلاقة بين المصلحة الوطنية لنهر الليطاني و الجهات الحكومية الاخرى؛
٤ - تحديد المزارعين ذوي القدرة على اخذ القرار لجهة مصدر المياه (مياه جوفية أو سطحية)؛
٥ - تقييم رضى المزارعين عن خدمات الري التي تقدمها المصلحة الوطنية لنهر الليطاني.

ومن ثم تم تطوير استبيان بسيط ومركز لمعالجة المواضيع البحثية الخمسة اعلاه حيث تم تعيين حجم عينة المسح بـــ ٥٠ مزارع، كحل وسط فيما بين الحاجة إلى وجود عينة معبرة يمكن الاعتماد عليها، الامر الذي يتطلب ٢٠ إلى ٣٠ مزارع عن كل ١٠٠ مزارع وحيث ان اجمالي المزارعين في المنطقة يتراوح بين ٢٠٠ إلى ٣٠٠ والمشتركين في ري الليطاني ١٠٠، لذلك تم اختيار ٤٢ مزارعاً من المشتركين بطريقة عشوائية و٨ مزارعين من غير المشاركين والذين يعتمدون على الآبار الجوفية الخاصة اما بالنسبة إلى اعمار المشتركين في المسح فتراوحت بين ٢٠ و٧٠ عاماً، ٩٢٪ منهم من الذكور و٨٪ من الاناث. وبهذه الطريقة يمكن اعتبار هذا المسح يعكس بشكل كبير الواقع.

وقد اجري هذا المسح لأول مرة في العام ٢٠١٠ وتبعه مسح آخر في العام ٢٠١١ .

مسح العام ٢٠١٢

إن تحقيق جمع المعلومات بشكل كامل ودقيق لمسح العام ٢٠١٢ اعتمد على اجراء المقابلات وجهاً لوجه مع خمسين مزارع (من اصل ٢٥٠ مزارع، ١٥٦ منهم مشتركين في خدمات الري للمصلحة الوطنية لنهر الليطاني) وذلك في ٦ قرى من البقاع الجنوبي وهي القرعون، بعلول، لالا، جب جنين، صغبين وكامد اللوز. اعتمد في هذا المسح نفس عدد المزارعين ونفس الاستبيان لمسح العام الماضي، مع ادخال بعض التعديلات بعد موافقة الـــ IRG . حيث تم ذلك على النحو التالي:

- تم اختيار ٤٢ مزارعاً مشتركاً من القائمة التي زودت بها مصلحة الليطاني الـــIRG (١٥٦ مزارع مشترك من بينهم ٦ مزارعات إناث)، وتم الاستناد على حجم العينة بالنسبة الى عدد المشتركين في كل منطقة جغرافية؛

- شارك في هذا المسح ٨ مزارعين غير مشتركين في خدمات الري المقدمة من قبل مصلحة الليطاني.

اجري العمل الميداني بين ٢١ تشرين الثاني و ١ كانون الاول من العام ٢٠١٢.

النتائج الرئيسية للمسح

يمكن تلخيص النتائج الرئيسية للمسح على النحو التالي:

إدراك المزارعين لمشاكل المياه: اعتبر (٣٦٪) من المستطلعين ان مشكلة التلوث هي المشكلة الاولى التي يواجهونها في قائمة قضايا المياه، يتبعها مشكلة توقيت اعطاء او توصيل المياه اليهم وكميتها. (٦٢٪) من المستطلعين اعتبر ان هذه المشكلة هي من مسؤلية مصلحة الليطاني. في حين قلل (٣٦٪) من المستطلعين من اهمية التعاون فيما بينهم وبين مصلحة الليطاني من نتائج التشارك في حل المعضلات بينما عبر (٣٦٪) منهم عن اهميتها. واعتقد المزارعون ان لديهم من الخبرة ما يمكنهم من حل معضلات المياه.

ارادة المزارعين في حل قضايا المياه: عبر غالبية المستطلعين عن عدم استعدادهم لتقديم التنازلات من اجل بعضهم البعض ، والبعض غير مقتنع باهمية جمعيات المزارعين. ٨٢٪ من المزارعين المستطلعين مستعدين لدفع مبلغ اكبر مقابل ان تزودهم مصلحة الليطاني بالمياه اثناء الشحائح ولو خارج التوقيت التقليدي لموسم الري.

العلاقة ما بين المصلحة الوطنية لنهرالليطاني والجهات الحكومية الاخرى: هناك تراجع في العلاقة ما بين المزارعين ومصلحة الليطاني: ٦٠٪ من المستطلعين لم يتلقوا الارشاد من مصلحة الليطاني ومعظمهم يلتقي مع عمال المصلحة فقط مع بداية موسم الري اي لدى ذهابهم للتسجيل في مكاتب المصلحة او عند الحاجة، كما ابدى المستطلعين استياءهم من جمعيات مستخدمي المياه ومراكز الزراعة الاقليمية والدور السلبي للتعاونيات الزراعية، وقد عبر جميع المستطلعين عن رغبتهم في تلقي الارشاد الزراعي من قبل وزارة الزراعة والمؤسسات الرديفة وان ينحصر دور المصلحة الوطنية لنهر الليطاني في تحسين وتنظيم ادارة المياه وتوزيعها.

اختيار المزارعين لنظم الري: إن اكثر نظم الري اعتماداً في منطقة الاستطلاع هي الري بالتنقيط او الرش، ومع ذلك فإن نسبة صغيرة (٨٪) لا تزال تعتمد الري بالتطويف. وبالنسبة إلى تحدد طريقة الري هو ملاءمتها للمحاصيل حيث ان معظم المزارعين يستخدمون الري بالتنقيط للخضار والاشجار المثمرة اوبالرشاشات للبطاطا.

تسعيرة المياه من قناة الري ٩٠٠: ان تسعيرة المياه من قناة الري ٩٠٠ هي عادلة. من الملاحظ ان التسعيرة تعتمد على حجم العقار وهي تغطي كامل موسم الري (عادة بالدنم) هذا النظام لا يعتمد على كمية المياه، وهومؤشر لكفاءة نظام الري.

بالإضافة إلى ذلك، فإن مياه القناة٩٠٠ هي اقل كلفة ومتاحة للمزارعين الذين شملتهم الدراسة، ومع ذلك فهي ملوثة وتوقيت وكمية توصيلها غير ملائمين.

رضا المزارعين عن الخدمات التي تقدمها المصلحة الوطنية لنهر الليطاني: لقد تراجع مستوى رضا المستطلعين عن الخدمات حيث عبر(٤٣٪) من المستطلعين عن رضاهم عن خدمات المصلحة في العام ٢٠١٢ وهذا مشابه للعام ٢٠١٠ اي(٤٦٪) بعد المستوى الجيد عن الرضا في العام٢٠١١ اي (٦٩٪) وهذا التراجع يعود إلى ان المصلحة تأخرت في تزويد المزارعين بالمياه إلى منتصف ايار بسبب اضراب عمال التوزيع في مصلحة الليطاني. على عكس العام ٢٠١١ حيث اعتمد مستوى الرضى العالي على عوامل خارجية وما يزيد الوضع سوءاً هو نقص المتساقطات (حتى منتصف ايار) واذا ما حصل اي تأخير في بدء عمل القناة مع بداية توقف الامطار (اوائل نيسان) حيث ان عمل القناة يبدأ عادةً من منتصف نيسان إلى آخره.

1. INTRODUCTION

1.1. AUTHORIZATION

International Resources Group (IRG) was contracted by USAID/Lebanon (Contract EPP-I-00-04-00024-00 Task Order No. 7) under the Integrated Water and Coastal Resources Management Indefinite Quantity Contract (IQC) II to implement the Litani River Basin Management Support (LRBMS) Program.

1.2. PROGRAM OBJECTIVES

The purpose of the LRBMS Program is to set the ground for improved, more efficient and sustainable basin management at the Litani river basin through provision of technical support to the Litani River Authority and implementation of limited small scale infrastructure activities.

The LRBMS program is part of USAID's increasing support for the water sector in Lebanon. The Litani River Basin suffers the fate of many river basins around the world: increasing demands compete for limited natural resources. Groundwater over-exploitation, deforestation and overgrazing, unplanned urban sprawl, untreated wastewater effluents, and unsustainable agricultural practices contribute to environmental degradation in the form of declining water and soil quality.

Solutions do exist to reverse these trends and establish sustainable management practices. The key to successfully implement such solutions requires applying the principles of Integrated Water Resources Management (IWRM) through a single river basin authority rather than multiple agencies responsible for different aspects of water management as is the case in many countries. Fortunately, the existence of the Litani River Authority (LRA) provides a unique platform to become such an IWRM river basin authority that will mobilize stakeholders in the river basin and address these challenges in an integrated manner.

Successful implementation of LRBMS will prepare the LRA to assume the role of an integrated river basin authority upon the removal of the present legal constraints.

1.3. PROGRAM COMPONENTS

Under the LRBMS program, LRBMS will work with national and regional institutions and stakeholders to set the ground for improved, more efficient and sustainable basin management at the Litani River basin. The LRBMS technical assistance team will provide technical services and related resources to LRA in order to improve their planning and operational performance and equip them with the necessary resources for improved river basin management.

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To achieve the LRBMS program objectives, the Contractor shall undertake tasks grouped under the following four components:

1) Building Capacity of LRA towards Integrated River Basin Management
2) Long Term Water Monitoring of the Litani River
3) Integrated Irrigation Management which will be implemented under two sub-components:
    a. Participatory Agriculture Extension Program: implemented under a Pilot Area: West Bekaa Irrigation Management Project
    b. Machghara Plain Irrigation Plan
4) Risk Management which will be implemented under two sub-components:
    a. Qaraoun Dam Monitoring System
    b. Litani River Flood Management Model

1.4. PURPOSE OF THE REPORT

As part of the implementation of the LRBMS Program, IRG is to monitor progress and achievements through a Performance Monitoring Plan (PMP). The LRBMS PMP uses thirteen indicators, some of them being drawn from the USAID Lebanon Performance Management Plan. One of these indicators is a customer satisfaction survey to be carried out under LRBMS.

This indicator was defined under LRBMS as focusing on the only water users that are directly served by LRA, the counterpart agency, that is the farmers located next to "Canal 900" and who annually subscribe to receive irrigation water (among other responsibilities, LRA manages an irrigation system based around "Canal 900", a canal supplied with water pumped from Qaraoun reservoir and which serves about 600 ha around the town of Joub Jenine). In order to assess the level of satisfaction of these farmers, a survey was thus conducted to investigate farming practices and notably farmers' interactions and satisfaction with the services provided by LRA

This report presents the results of the second follow–up survey conducted by Information International sal (a research consultancy firm), upon the request of IRG as part of the implementation of the LRBMS program.

The survey looks mainly into assessing the level of satisfaction of farmers from LRA services as well as investigating their farming practices.

1.5. CONTENT OF THE REPORT

The remainder of the report is divided into two chapters:

- Chapter 2 describes the objectives of the survey, the methodology used as well as the problems faced.
- Chapter 3 presents the results of the survey and related analysis.

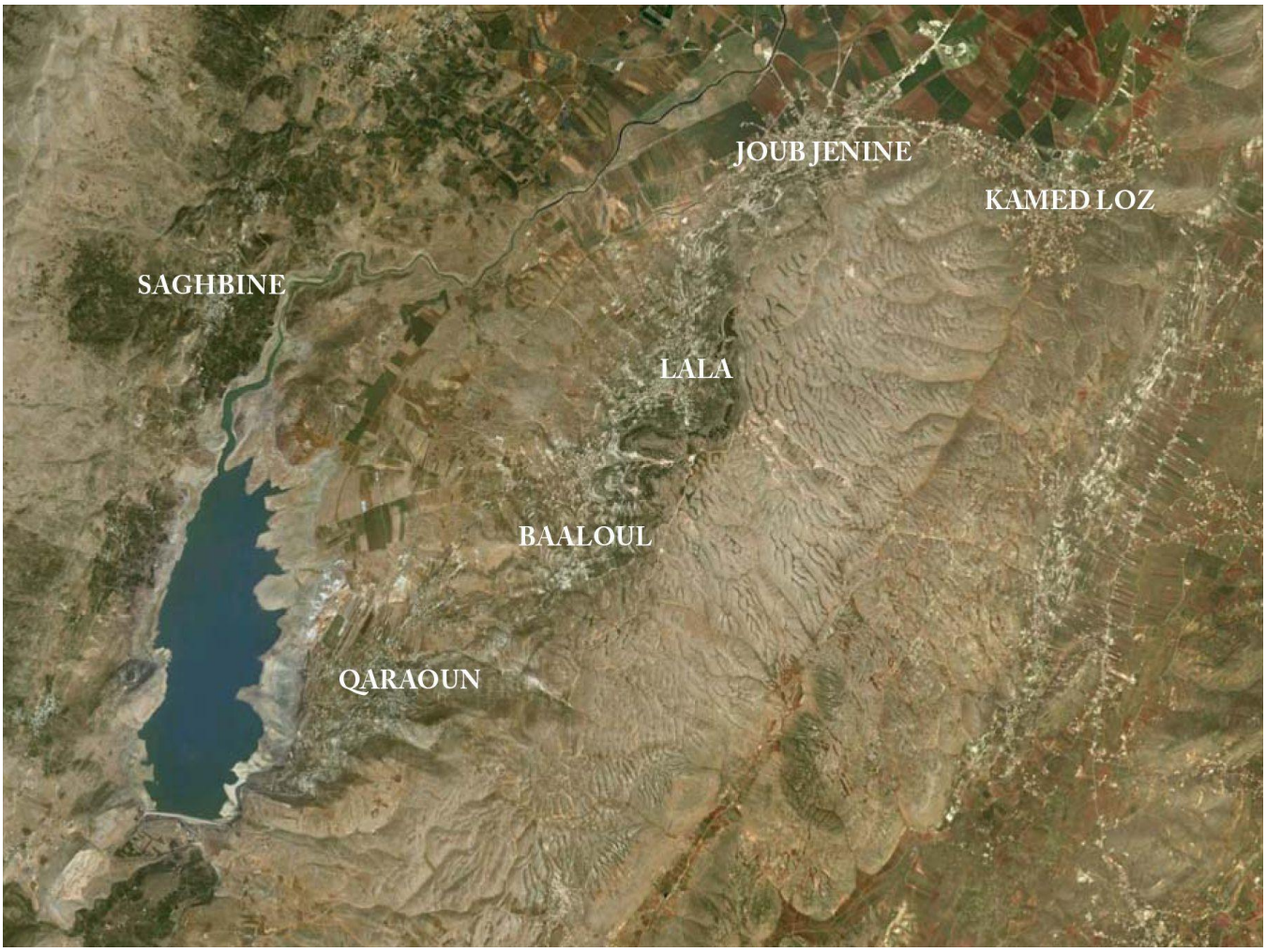
2. SURVEY AREA AND PRINCIPLES

2.1. SURVEY AREA

As per last year, the follow up survey was conducted with farmers in the Canal 900 command area of the LRA in Central Bekaa, including the following villages: Qaraoun (257 hectares), Baaloul (68 hectares), Lala (247 hectares), Joub Jenine (900 hectares), Saghbine (120 hectares) and Kamed Loz (320 hectares).

The overall area that is eligible for irrigation in the related six villages is 2,000 hectares. 1,912 hectares are equipped to be irrigated but only 1,620 hectares are currently being irrigated.

Survey Area



2.2. SURVEY APPROACH

The same questionnaire used in the 2011 survey was adopted for the current second follow –up survey as per the Client request (Appendix A).

The list of subscribed farmers in 2012 (156 subscribers) was obtained from IRG. The farmers were stratified by location within the command area, size of holding as well as type of farming and cropping patterns in order to ensure a representative sample.

The number of farmers needed by geographic area and size of holding was calculated. A systematic random sample was then adopted to select the farmers who would constitute potential respondents for the current survey.

As mentioned previously, and as per last year's distribution, the sample consisted of 42 subscribed farmers who pay LRA for water delivery from canal 900 (around 81% of the sample) and another eight (8) non-subscribed farmers who pump from wells (around 19% of the sample).

The subscribed farmers were drawn from the list provided by LRA, stratified by location within the command area, size of holding as well as type of farming and cropping patterns in order to ensure a representative sample.

The non subscribed farmers were drawn from lists obtained from the relevant municipalities and fellow farmers.

Face to face interviews were conducted with the selected farmers, using the same questionnaire that was administered through the 2011 survey to allow for comparison of results.

2.3. PROBLEMS FACED IN THE FIELD

The data collection was undertaken by eight experienced field workers and two supervisors. As per Ii's policy, the field workers were first trained by a Senior Analyst on the questionnaire before the field survey.

Throughout the data collection period, the following problems were faced by the field work team:

- Difficulties in finding the selected farmers at home, as some of them were in their fields, which necessitated escorting them to their land plots.
- Some farmers were found to actually own a high number of cultivated dunums but were registered with LRA as having only a small percent of their actual land plots in order not to pay high irrigation fee.
- In some areas, as in Kamed Loz, the list of subscribed framers provided by IRG included numerous farmers. However, in fact, only 5 of them actually own land but have registered some of their plots in their relatives' names (who actually are not farmers) in order to have access to a higher quantity of irrigation water.

2.4. DATA CHECKING/ENTRY/ANALYSIS

Once the questionnaires were cleared by the supervisors, they were transferred to the coding/entry department where they underwent complete logical checking. The coding officers carried out the following tasks:

- Assign a serial number to each questionnaire
- Review each questionnaire
- Code each complete questionnaire.

In order to ensure the accuracy of information, the data entry function and the data cleaning were carried out independently, using the ACCESS program.

The Assistant Analyst and the database developer, especially trained by the Data Analyst Supervisor for the application, were responsible for structuring the application and checking the work of the data operators.

The Senior Analyst investigated the findings in accordance with the study objectives and management instructions. The SPSS software package was utilized for the data analysis.

3. SURVEY RESULTS

3.1. SAMPLE DESCRIPTION

The sample consists of 50 farmers: 42 subscribed with the LRA, and 8 farmers who are not subscribed, as requested by the Client in order to maintain last year's survey distribution.

94% of the interviewed farmers were males and 6% females. Their ages range from 25 to 72 years old, with a mean age of 50 years. 28% are between 45 and 54 years of age, and 24% are above 65.

Table 1: Age distribution of Surveyed Farmers

Age of Farmers	Percent
25-34	18.0%
35-44	16.0%
45-54	28.0%
55-64	14.0%
65+	24.0%
Total	***100.0%***

20% of the farmers are from Qaraoun, 14% from Saghbine, 20% from Lala, 4% from Baaloul, 20% from Joub Janine and 22% from Kamed Loz.

The majority of the interviewed farmers do not rely on family labor in their agricultural activities as 40% reported not to have family workers. 20% have one family worker, and another 20% have two.

Table 2: Number of Family Workers

Number of Family Workers	Percent
0	40.0%
1	20.0%
2	20.0%
3	6.0%
4	4.0%
5	6.0%
6	2.0%
9	2.0%
Total	***100.0%***

Around one third of the surveyed farmers do not have permanent workers (32%). 14% and 12% respectively state that they have 1 and 2 permanent workers with the number of such workers ranging from 0 to 25 workers.

Table 3: Number of Permanent Workers

Number of Permanent Workers	Percent
0	32.0%
1	14.0%
2	12.0%
3	10.0%
4	8.0%
5	8.0%
6	8.0%
8	2.0%
9	2.0%
15	2.0%
25	2.0%
Total	***100.0%***

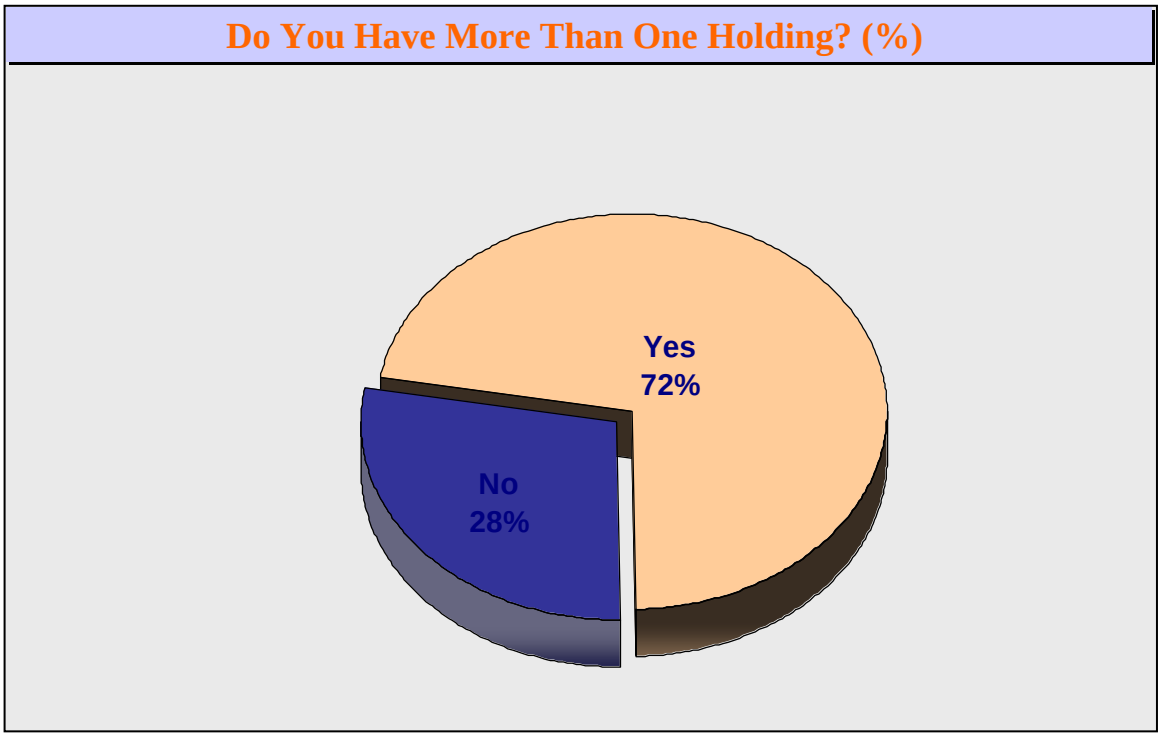
The number of seasonal workers ranges from 0 to 70, with 22% having 30 workers.

Table 4: Number of Seasonal Workers

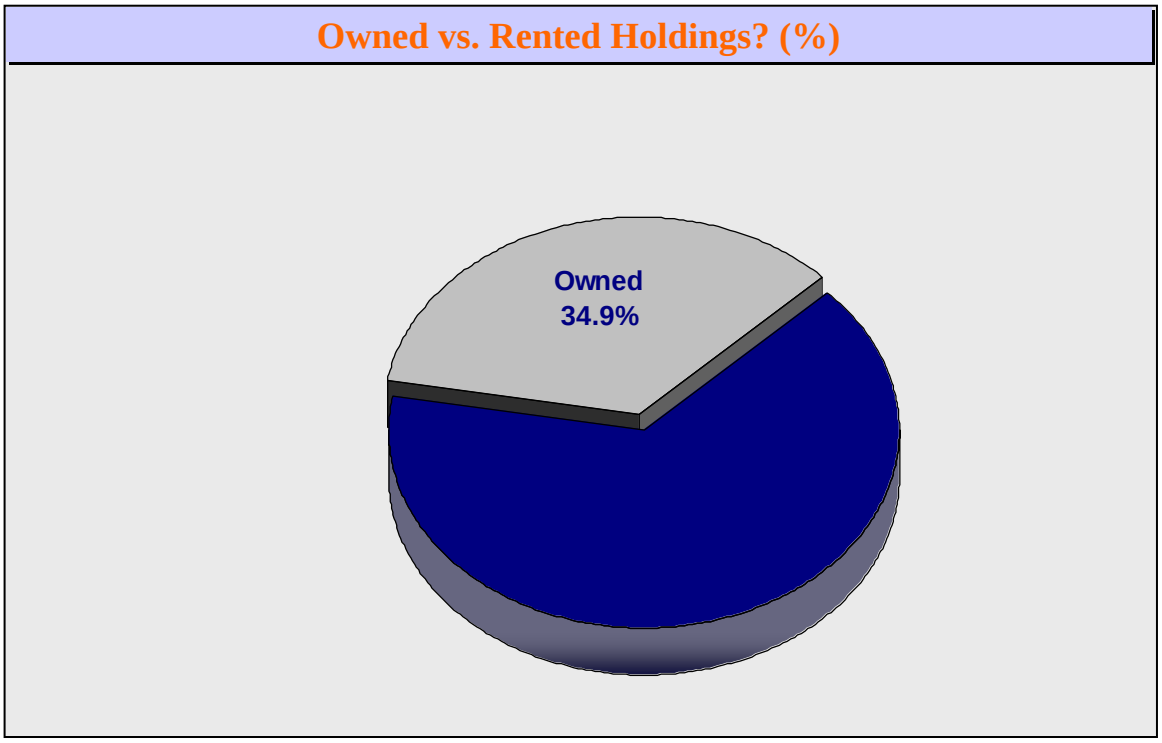
Number of Seasonal Workers	Percent
0	4.0%
2	6.0%
3	6.0%
4	2.0%
5	14.0%
6	2.0%
7	2.0%
8	4.0%
10	14.0%
14	2.0%
15	10.0%
20	4.0%
25	2.0%
30	22.0%
40	2.0%
50	2.0%
70	2.0%
Total	***100.0%***

Respondent farmers operate 109 holdings (93 for the LRA subscribed farmers and 16 for the non-subscribed ones); 72% operate more than one holding while only 28% operate a single holding. 65.1% of the holdings are rented, compared to 34.9% that are owned.

Graph 1: Do you Have More than One Holding?



Graph 2: Rented Vs. Owned Holdings



The type of soil of the farmers' holdings- as reported by the farmers in the survey- is mainly red soil (36.6%), followed by clay (24.6%) and sand (16.4%).

Table 5: Type of soil of Holdings as reported by Farmers

Type of Soil	Percent
Sand	16.4%
Silt	13.4%
Clay	24.6%
Red	36.6%
White	6.7%
Gray	2.2%
Total	***100.0%***

The average size of the holdings was around 47.8 Dunums, ranging from 0.8 Dunum to 600 Dunums. The majority of the surveyed farmers report to irrigate their holdings 12, 10 or 8 hours per day (13.8%, 10.1% and 12.8% respectively), though with differences among those who are subscribed and those who are not.

Table 6: Hours of Irrigation per day

	LRA Subscribers	Private Own and Common Wells	Overall
Hours of Irrigation per Day	**Percent**	**Percent**	**Percent**
0	0.0%	6.3%	0.9%
0.4	5.4%	0.0%	4.6%
1.5	2.2%	6.3%	2.8%
2	2.2%	0.0%	1.8%
4	3.2%	0.0%	2.8%
5	8.6%	0.0%	7.3%
6	9.7%	0.0%	8.3%
8	12.9%	12.5%	12.8%
9	4.3%	0.0%	3.7%
10	10.8%	6.3%	10.1%
12	11.8%	25.0%	13.8%
15	5.4%	0.0%	4.6%
24	6.5%	12.5%	7.3%
Do Not Know	17.2%	31.3%	19.3%
Total	***100.0%***	***100.0%***	***100.0%***

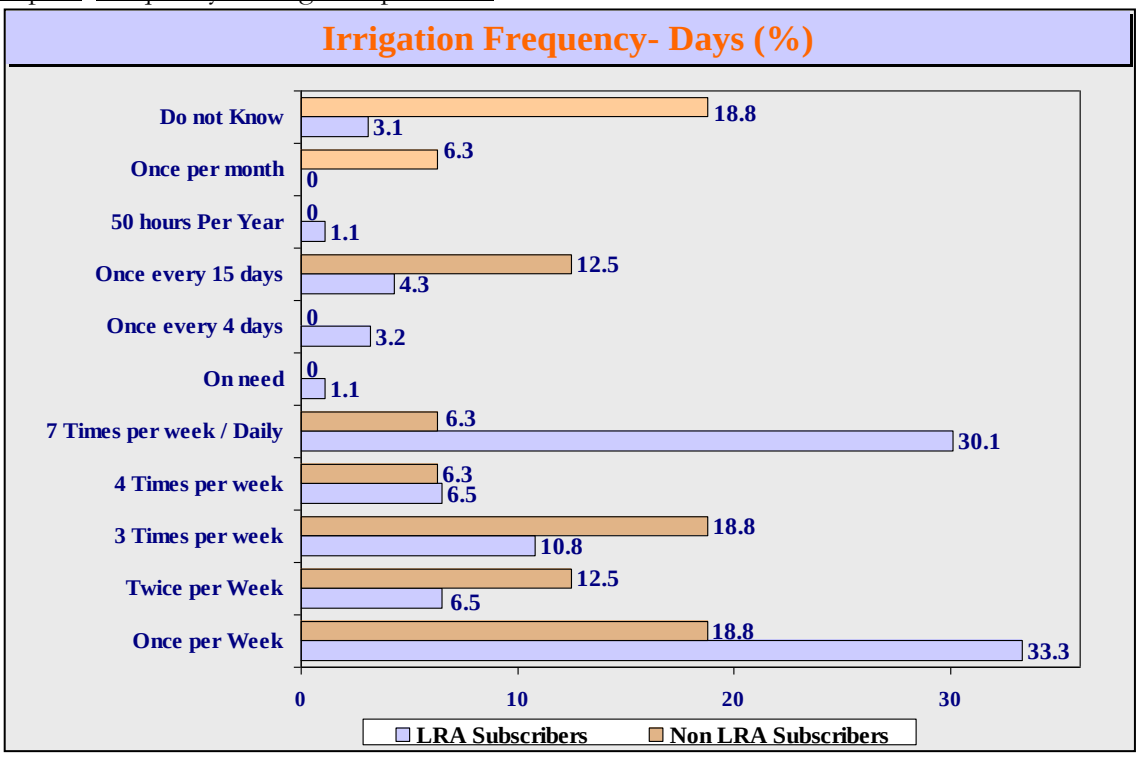
The water pressure variations (in Bars) at the field hydrant are detailed in Table 7, the most frequent being 2 Bar and 4 Bar. Noteworthy, is that the 2 Bar water pressure is only recorded among LRA subscribers (23.7%).

Table 7: Water Pressure

Water Pressure (Bar)	LRA Subscribers	Private Own and Common Wells	Overall
	Percent	Percent	Percent
0	1.1%	0.0%	0.9%
0.75 Bar	1.1%	0.0%	0.9%
1 Bar	2.2%	6.3%	2.8%
1.5 Bar	3.2%	0.0%	2.8%
2 Bar	23.7%	0.0%	20.2%
2.5 Bar	5.4%	0.0%	4.6%
3 Bar	15.1%	18.8%	15.6%
4 Bar	22.6%	25.0%	22.9%
5 Bar	11.8%	25.0%	13.8%
6 Bar	6.5%	18.8%	8.3%
Do not Know	7.5%	6.3%	7.3%
Total	***100.0%***	***100.0%***	***100.0%***

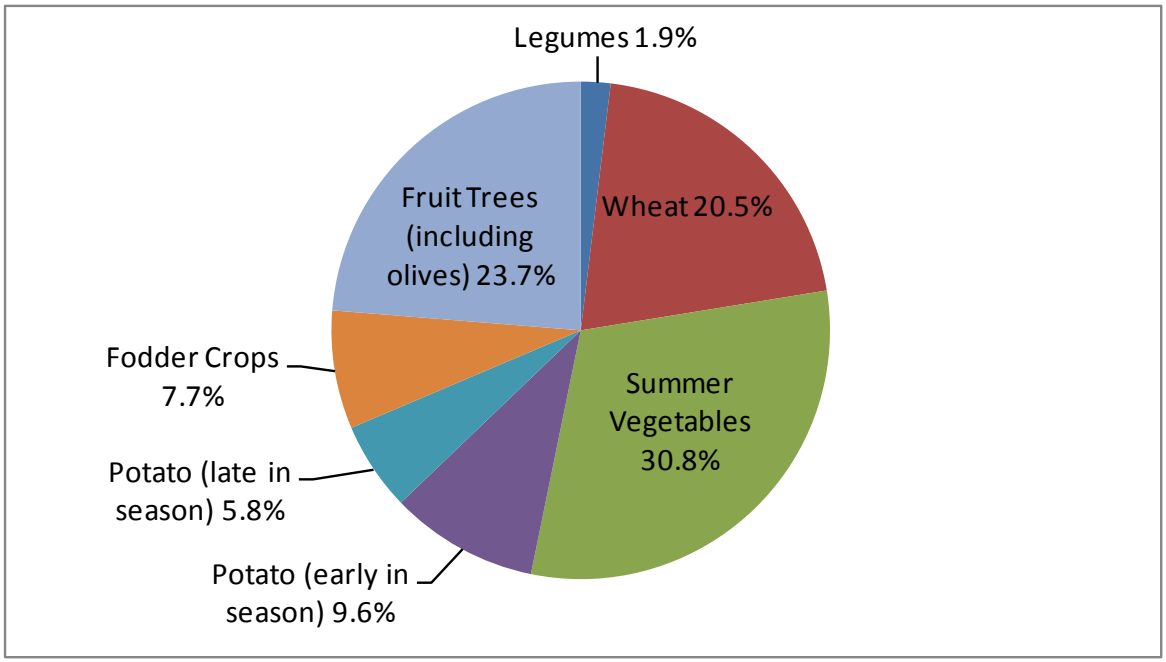
Frequency of irrigation varies between LRA subscribers and non LRA subscribers, where the majority of subscribers tend to irrigate their plots once per week (33.3%) or on a daily basis (30.1%), compared to a majority of 18.8% of non subscribers who report to irrigate their land both once a week and 3 times a week respectively.

Graph 3: Frequency of Irrigation per Week



The types of crops planted by the surveyed farmers included mainly summer vegetables (30.8%), fruit trees (including olives) (23.7%) and wheat (20.5%).

Graph 4: Types of Crops Planted



The detailed distribution of the various crops planted by the surveyed farmers is detailed in the below table.

Table 8: Crops planted by farmers in each season by total area of subscribed vs. non-subscribed farmers

	% of total Area	% of total Area for Subscribers	% of total Area for non-Subscribers	% of total Area for Joub Jennine, Kamed Loz	% of total Area for Qaraoun, Baaloul, Saghbine, Lala
Fodder Crops	4.7%	5.1%	3.6%	4.1%	5.7%
Fruit Trees	3.8%	5.1%	0.1%	0%	10.4%
Legumes	2.0%	2.7%	0%	1.5%	2.8%
Potatoes (late in season)	21.4%	26.0%	8.7%	16.6%	29.8%
Potatoes (early in season)	30.6%	32.4%	25.6%	31.0%	29.8%
Summer Vegetables	46.7%	43.5%	55.5%	46.4%	47.2%
Wheat	45.4%	35.3%	73.3%	54.5%	29.5%
Grand Total	***154.5%***	***150.1%***	***166.7%***	***154.2%***	***155.1%***

3.2. FARMERS PERCEPTION OF WATER ISSUES

3.2.1. MAIN WATER ISSUES FACED BY FARMERS

The three main water issues faced by farmers were:

1. Pollution (36%)
2. Water Quantity Insufficiency (22%)
3. Water Delivery Timing (20%)

Pollution ranks first (36%) on the list of water issues faced by the interviewed farmers, followed by water quantity insufficiency (22%). Water delivery timing ranks third with 20%.

This comes in accordance with the results of last year's survey where pollution was by far the most prevalent water issue for the farmers. Noteworthy, is that only 8% of the respondent farmers reported not to face water issues, down from 16% in 2011.

Table 9: Major Water-Related Problems Faced by Farmers*

Water-Related Problems	**2012 Survey Percent**	**2011 Survey Percent**
Water pollution	36.0%	36.0%
Water quantity insufficiency	22.0%	26.0%
Water delivery timing	20.0%	30.0%
Sediment / obstruction of pipeline	18.0%	6.0%
High cost / the cost of diesel and pumps	14.0%	20.0%
Low water pressure	10.0%	4.0%
No problems in the water	8.0%	16.0%
Scarcity of water in the summer	6.0%	6.0%
Network Problems	4.0%	6.0%
Payment of subscription in cash at a time when the farmer is unable to secure the amount	4.0%	2.0%
Poor distribution of water	2.0%	6.0%
Lack of electricity, which increases the cost of pumping water	2.0%	2.0%
Unpleasant odor of the water	2.0%	0.0%
Worms on crops	2.0%	0.0%
Irrigation during the day time	2.0%	0.0%
Water scarcity due to lack of rain	2.0%	0.0%
Maintenance of pumps	0.0%	6.0%
Theft of pipes	0.0%	2.0%

** Multiple Response Question*

The water pollution issue was mainly mentioned by Lala and Kamed Loz farmers (38.9% and 22.2% respectively), as in the 2011 survey.

Table 10: Water Pollution Issue by Village

Village	2012 Survey Percent	2011 Survey Percent
Qaraoun	11.1%	5.6%
Saghbine	11.1%	5.6%
Lala	38.9%	38.9%
Baaloul	5.6%	11.1%
Joub Janine	11.1%	16.7%
Kamed Loz	22.2%	22.2%
Total	***100.0%***	***100.0%***

In addition, water pollution was mainly mentioned by farmers who plant fruit trees (31.7%) and those who plant summer vegetables (27.0%).

Table 11: Water Pollution Issue by Type of Crops Planted

Type of Crops	2012 Survey Percent	2011 Survey Percent
Fruit Trees (including olives)	31.7%	21.4%
Summer Vegetables	27.0%	14.3%
Fodder Crops	17.5%	0.0%
Wheat	11.1%	14.3%
Potato (early in season)	6.3%	25.0%
Legumes	3.2%	3.6%
Potato (late in season)	3.2%	14.3%
Winter Vegetables	0.0%	7.2%
Total	***100.0%***	***100.0%***

On the other hand, the insufficiency of water provided is raised mainly in Joub Janine (45.5%) and in Qaraoun, replacing Lala in the second rank with 27.3%. It was also raised by farmers who plant summer vegetables (44.4%), wheat (16.7%) and potato (early in season) (16.7%).

Table 12: Insufficiency of Water Provided by Village

Village	2012 Survey Percent	2011 Survey Percent
Qaraoun	27.3%	15.4%
Lala	18.2%	23.1%
Baaloul	9.1%	0.0%
Joub Janine	45.5%	38.5%
Saghbine	0.0%	15.4%
Kamed Loz	0.0%	7.7%
Total	***100.0%***	***100.0%***

Table 13: Insufficiency of Water Provided by Type of Crops Planted

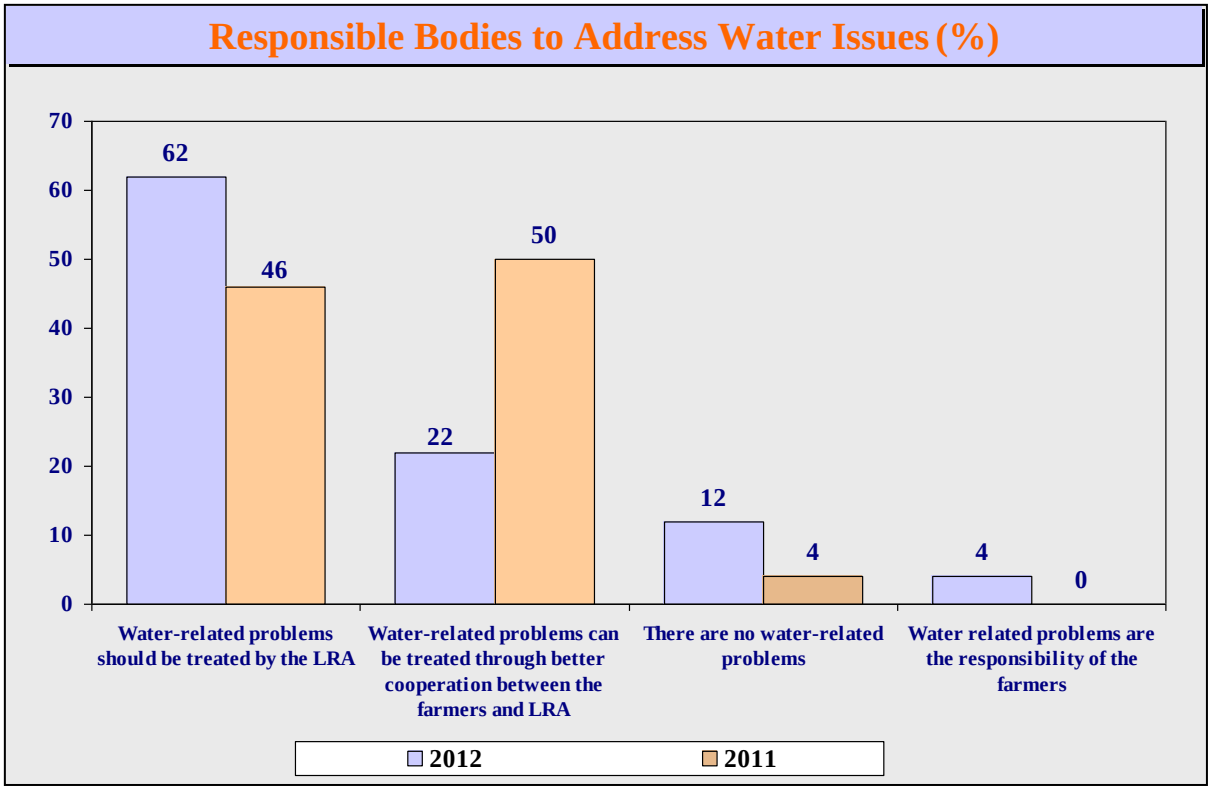
Type of Crops	2012 Survey Percent	2011 Survey Percent
Legumes	2.8%	8.7%
Wheat	16.7%	4.3%
Summer vegetables	44.4%	21.7%
Winter Vegetables	0.0%	8.7%
Potato (early in season)	16.7%	13.0%
Potato (late in season)	11.1%	8.7%
Fruit Trees (including olives)	8.3%	26.1%
Fodder Crops	0.0%	8.7%
Total	***100.0%***	***100.0%***

3.2.2. RESPONSIBLE BODY TO ADDRESS WATER ISSUES

62% of the farmers believe that water related problems should be treated by the LRA, while 22% insist that solving water related problems should be done through better cooperation between the farmers and the LRA. Only 12% of the farmers answered that there are no water related problems and another 4% reported that water related problems are the responsibility of the farmers.

The results of last year's survey were different, where the majority of interviewed farmers stated that problems should be solved through better cooperation between the LRA and the farmers, and where only 4% said they faced no water related problems.

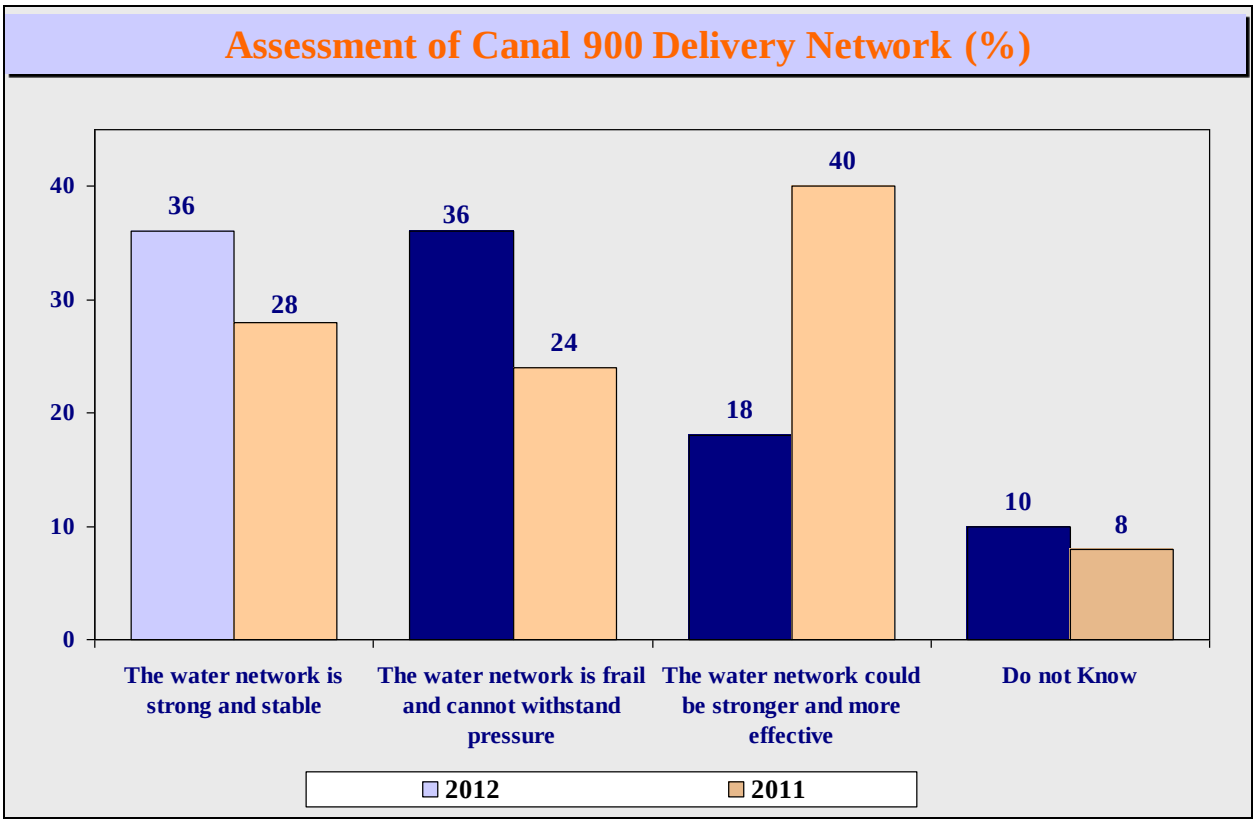
Graph 5: Responsible Bodies to Address Water Issues



3.2.3. FARMERS' ASSESSMENT OF THE CANAL 900 DELIVERY NETWORK

In contrast with the previous results of the Canal 900 in the 2011 survey, only 18% of respondents in 2012 believed that the water network could be stronger and more effective, compared to 40% in 2011. 36% of farmers described the water network as strong and effective, but another 36% still described it as frail and unable to withstand water pressure. This serves as an indicator of a slight development in the state of the network since last year.

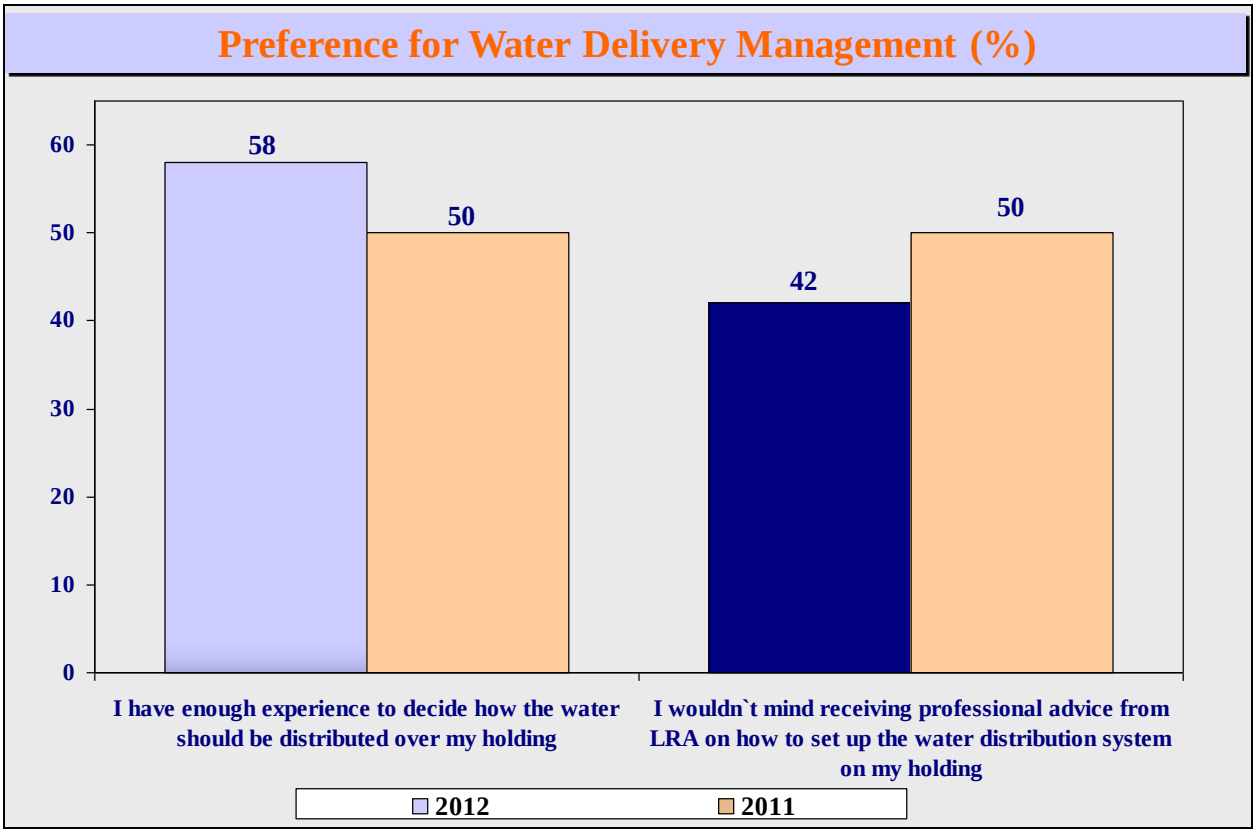
Graph 6: Assessment of Canal 900 Delivery Network



3.2.4. FARMERS PREFERENCE FOR WATER DELIVERY MANAGEMENT

More farmers consider themselves experienced enough to master their irrigation schedule versus those who do not mind receiving technical advice from the LRA (58% and 42% respectively). The 2011 survey showed an equal split of 50%-50% between the two categories.

Graph 7: Preference for Water Delivery Management



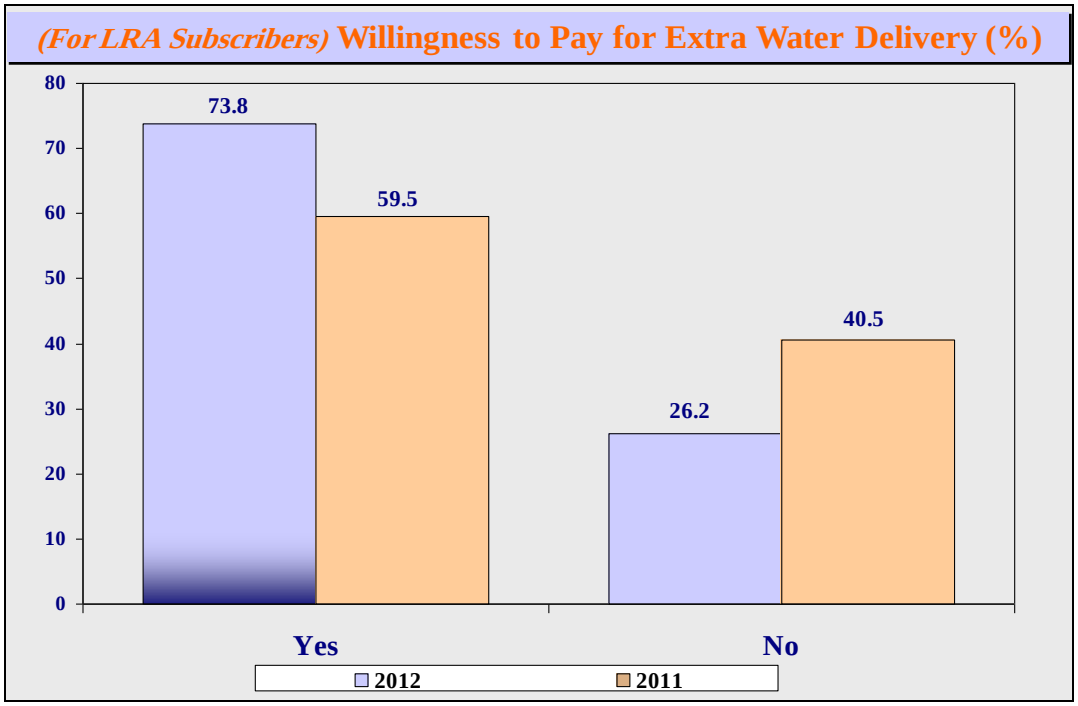
3.3. FARMERS WILLINGNESS TO SOLVE WATER ISSUES

3.3.1. FARMERS' WILLINGNESS TO PAY FOR EXTRA WATER DELIVERY

As the insufficiency of the water provided was reported by the interviewed farmers among the main water related problems they were facing, they were asked whether they were willing to pay an extra amount of money if the LRA was willing to give irrigation out of the regular times when the rainfall is scarce. A majority of the farmers (73.8%) are willing to do so, compared to only 26.2% who rejected the idea.

This trend conforms to last year's one, but where only 59.5% of interviewed farmers expressed their willingness to pay extra money to receive water outside of the Canal 900 operating period, which extends from May to October.

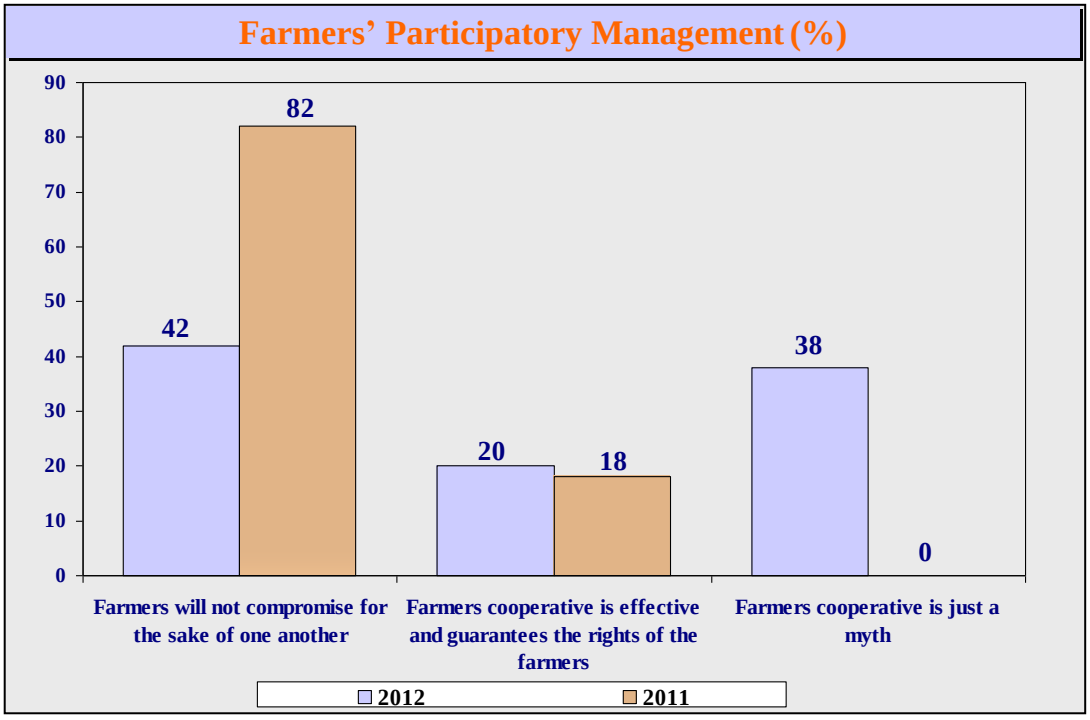
Graph 8: Willingness to Pay for Extra Water Delivery



3.3.2. FARMERS' PARTICIPATORY MANAGEMENT

In an attempt to assess the Farmers' Participatory Management, the findings of this year survey were more advantageous, compared to the last year survey. Indeed, this year survey points out that 42% of the interviewed farmers believed that they wouldn't assume any compromise for the sake of other farmers, compared to 82% of respondents to the same query the last year.

Graph 9: Farmers' Participatory Management



In addition, 42% of surveyed farmers report that they never hold meetings with other farmers to discuss various water management issues and another 50% state that they would never compromise and make sacrifices for the sake of the community benefits.

3.4. RELATIONSHIP WITH AND AWARENESS OF ROLES OF LRA AND OTHER GOL AGENCIES

3.4.1. FARMER-LRA INTERACTIONS

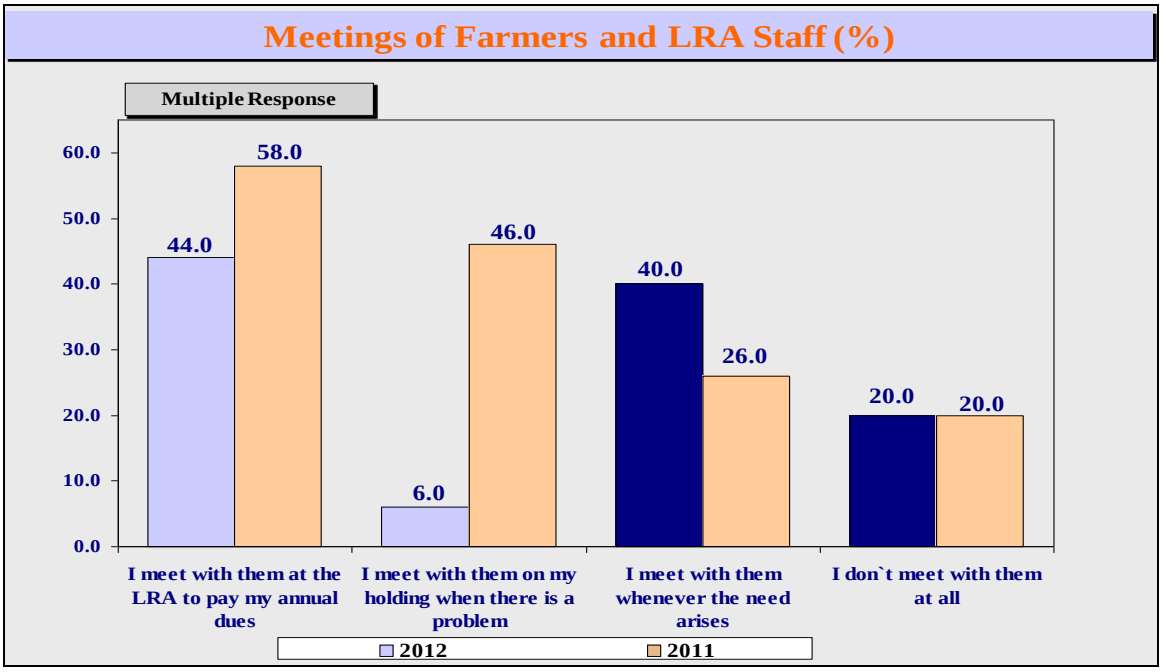
The interaction of the farmers and the LRA does not seem to be very efficient. 60% of interviewed farmers never receive advice from the LRA and another 14% receive related advice very rarely. This is somewhat reflective of last year's results, although more negative, as 42% reported to never have received advice in last year's survey. In addition, 34% of the farmers never receive explanations pertaining to sudden water shortages, and another 40% are never or rarely notified of upcoming maintenance activities, reflecting therefore a weak communication between the farmers and LRA.

Table 14: Relationship of Farmers and LRA

	Always (Daily)		Often (Once a week)		Sometimes (Once a month		Rarely (Once a year)		Never		Do Not Know		Total	
	2012	2011	2012	2011	2012	2011	2012	2011	2012	2011	2012	2011	2012	2011
How often do you: Receive advice from LRA	2.0%	6.0%	2.0%	6.0%	10.0%	12.0%	14.0%	26.0%	60.0%	42.0%	12.0%	8.0%	100.0%	100.0%
How often do you: Receive explanation for sudden water shortage	18.0%	20.0%	8.0%	18.0%	8.0%	12.0%	20.0%	18.0%	34.0%	22.0%	12.0%	10.0%	100.0%	100.0%
How often do you: Get notified of prospective maintenance works	34.0%	20.0%	2.0%	12.0%	10.0%	12.0%	16.0%	24.0%	24.0%	24.0%	14.0%	8.0%	100.0%	100.0%

Less than half of the farmers meet with LRA staff only when they pay their annual dues (44%) or whenever the need arises (40%). This differs from the results obtained last year. A big change is noted among those who meet with LRA staff when there is a problem; 46% of farmers reported to do so in 2011 compared to 6% in 2012. But just as the previous round, 20% of them said they do not meet with LRA staff at all.

Graph 10: Meetings of Farmers and LRA Staff



On the problem of water pollution, the majority of the farmers (70%) consider that the LRA should be more active in controlling and solving the problem, compared to 28% who consider that the LRA is not dealing with this problem at all. None of the farmers finds that the LRA is actively involved in limiting and controlling the pollution problem. This indicates a negative assessment of the role of the LRA in treating this major water related issue.

The dissatisfaction of the farmers with the LRA's role in reducing the water pollution problem was reported to a lesser extent last year as 16% had found it actively involved in limiting and controlling the problem, and 48% said they should be more active towards this end.

Table 15: Role of LRA on the Water Pollution Problem

Role of LRA on the Water Pollution Problem	**2012**	**2011**
The LRA is actively involved in limiting and controlling this problem	0.0%	16.0%
The LRA should be more active in controlling and solving the problem	70.0%	48.0%
The LRA is not dealing with the problem of pollution whatsoever	28.0%	28.0%
There is no pollution problem	2.0%	6.0%
Do not Know	0.0%	2.0%
Total	***100.0%***	***100.0%***

On a separate note, farmers also hold the LRA responsible for some non-water related issues such as the control of water pollution (28%), supporting farmers through the provision of seeds and chemicals and through consultation (26%) as well as the date of water delivery (12%). This has changed drastically from 2011 where 24% of farmers were having trouble finding a market for their produce.

Table 16: Non-Water Related Problems that LRA Should Address*

Non-Water Related Problems that LRA Should Address	2012	2011
Water Pollution Control	28.0%	6.0%
Support Farmers (provision of seeds-chemical-engineering and consultancy)	26.0%	8.0%
Date of water delivery	12.0%	6.0%
Maintenance	8.0%	0.0%
No problems	8.0%	8.0%
Discharge of production	6.0%	0.0%
The establishment of the protection wall along the canal	6.0%	6.0%
Increase the amount of water for irrigation properties	6.0%	2.0%
Maintaining the cleanliness of the water from sediment	4.0%	6.0%
Restoration of semi-destroyed bridges	4.0%	2.0%
Favoritism	4.0%	4.0%
Demanding the full amount before sending the water	4.0%	4.0%
Compensations for farmers in cases of damage	4.0%	0.0%
Informing farmers of all issues	4.0%	0.0%
Real Estate located above the level of the channel	2.0%	6.0%
Provide medicine for diseases and other essential medicines	2.0%	12.0%
Show the limits of the Litani River and the lake	2.0%	10.0%
Investment in agricultural land by the Department of the Litani	2.0%	6.0%
Secure agricultural roads	2.0%	4.0%
Channel causing insects and odors	2.0%	6.0%
Strengthening and upgrading the pumps	2.0%	2.0%
Laboratories for the soil	2.0%	6.0%
Distribution of water is unfair	2.0%	2.0%
Not responsible for damages resulting from the malfunction	2.0%	2.0%
Algae in water blocks channels	2.0%	0.0%
Improving quality of seeds	2.0%	0.0%
Not interfering with farmers' affairs	2.0%	0.0%
Mismanagement	2.0%	0.0%
Examining the soil	2.0%	0.0%
Finding market for agricultural production	0.0%	24.0%
Others	0.0%	14.0%
Do not know	0.0%	8.0%

** Multiple Response Question*

3.4.2. FARMERS' KNOWLEDGE AND VIEWS OF THE ROLES OF OTHER GOL AGENCIES

Around half of the interviewed farmers consider the farmers' cooperatives and the government agricultural regional centers to be extremely inactive (40% and 50% respectively), and therefore do not provide the former with the desired level of assistance. As for local and international organizations, 64% of farmers find them to be somewhat inactive (up from 6% in 2011). This shows that farmers are not optimistic about agricultural agencies in their region. The results are somewhat similar to those of last year except for local/international organizations where 0% found them extremely inactive compared to 80% in 2011. Moreover, an increased number of farmers denied the existence of the listed centers/organizations whatsoever.

Table 17: Farmers' Views of Specific Agricultural Agencies

How active are each of the following:	Extremely Active		Somewhat Active		Somewhat Inactive		Extremely Inactive		Don't Know		Does not Exist		Total
	2012	2011	2012	2011	2012	2011	2012	2011	*2012*	*2011*	*2012*	*2011*	
Farmer Coop	2.0%	2.0%	6.0%	10.0%	2.0%	4.0%	40.0%	84.0%	10.0%	0.0%	40.0%	0.0%	***100.0%***
Government Agricultural Regional Centers	2.0%	4.0%	14.0%	14.0%	10.0%	10.0%	50.0%	72.0%	8.0%	0.0%	16.0%	0.0%	***100.0%***
Local / International Organizations	4.0%	6.0%	4.0%	8.0%	64.0%	6.0%	0.0%	80.0%	8.0%	0.0%	20.0%	0.0%	***100.0%***

But when asked who should be handling the extension services (advice on seeds, fertilizers, pesticides and cropping patterns), the majority of farmers (84%) expect these services to be handled by the Ministry of Agriculture and related agencies, while the water distribution at system level and plot level should be handled mainly by the LRA (54% for each).

The above results conform in a way with those of last year, where the same trend of answers was reported for the relevant questions. For example, 74% of farmers in the 2011 survey expected the Ministry of Agriculture to be responsible for the extension services and 84% and 68% respectively considered that water management on the system level and the plot level is the LRA's role.

Table 18: Farmers' Views of the Role of Other GOL Agencies in 2012

		LRA	Ministry of Agriculture & Extensions	Farmers	Ag. Assistants at shops	Farmer Associations	No One	Do not Know	Total
Extension Services (Advice on seeds, fertilizers, pesticides, cropping patterns)	**Who handles this now?**	10.0%	18.0%	38.0%	18.0%	0.0%	14.0%	2.0%	***100%***
	Who should handle it?	2.0%	84.0%	2.0%	4.0%	0.0%	0.0%	8.0%	***100%***
Water distribution at system level (canal 900 and Pump stations)	**Who handles this now?**	66.0%	6.0%	22.0%	0.0%	0.0%	0.0%	6.0%	***100%***
	Who should handle it?	54.0%	24.0%	10.0%	0.0%	0.0%	0.0%	12.0%	***100%***
Water distribution at plot level (rotation among farmers)	**Who handles this now?**	46.0%	0.0%	40.0%	2.0%	2.0%	2.0%	8.0%	***100%***
	Who should handle it?	54.0%	12.0%	22.0%	2.0%	0.0%	0.0%	10.0%	***100%***

Farmers' Views of the Role of Other GOL Agencies in 2011

		LRA	Ministry of Agriculture & Extensions	Farmers	Ag. Assistants at shops	Farmer Associations	No One	NGOs	Do not Know	Total
Extension Services (Advice on seeds, fertilizers, pesticides, cropping patterns)	**Who handles this now?**	8.0%	12.0%	54.0%	6.0%	8.0%	10.0%	2.0%	0.0%	***100%***
	Who should handle it?	12.0%	74.0%	8.0%	6.0%	0.0%	0.0%	0.0%	0.0%	***100%***
Water distribution at system level (canal 900 and Pump stations)	**Who handles this now?**	82.0%	0.0%	8.0%	4.0%	0.0%	2.0%	0.0%	4.0%	***100%***
	Who should handle it?	84.0%	4.0%	6.0%	0.0%	2.0%	0.0%	0.0%	4.0%	***100%***
Water distribution at plot level (rotation among farmers)	**Who handles this now?**	68.0%	2.0%	22.0%	0.0%	0.0%	4.0%	0.0%	4.0%	***100%***
	Who should handle it?	68.0%	2.0%	14.0%	2.0%	8.0%	0.0%	0.0%	6.0%	***100%***

3.4.3. FARMERS' NEEDS FOR TECHNICAL ASSISTANCE

All interviewed farmers express the extreme necessity to receive technical assistance, mainly for regular testing of the soil in professional laboratories (92%), as well as seeds and water (90% for each). The need for setting up a model parcel under LRA control where specialized experts would work and irrigation practices, fertilizer application and various agricultural practices is also reported as an urgent necessity (82%), while testing crops for quality and residues scored lowest but with 80%.

The latter result comes in accordance with the findings from the previous year where farmers found all five forms of technical assistance extremely necessary.

Table 19: Farmers' Needs for Technical Assistance

	Extremely unnecessary		Somewhat unnecessary		In between		Somewhat Necessary		Extremely Necessary		Total
	2012	**2011**	**2012**	**2011**	**2012**	**2011**	**2012**	**2011**	**2012**	**2011**	
Regular Testing of seeds in Professional Labs	4.0%	0%	2.0%	2.0%	4.0%	2.0%	0.0%	2.0%	90.0%	94.0%	100.0%
Regular testing of the water in Professional Labs	0.0%	2.0%	4.0%	0 %	0.0%	0 %	6.0%	0%	90.0%	98.0%	100.0%
Regular testing of the soil in Professional Labs	0.0%	0%	4.0%	2.0%	0.0%	0 %	4.0%	6.0%	92.0%	92.0%	100.0%
Testing the crop for quality and residues	0.0%	4.0%	6.0%	0%	4.0%	2.0%	10.0%	4.0%	80.0%	90.0%	100.0%

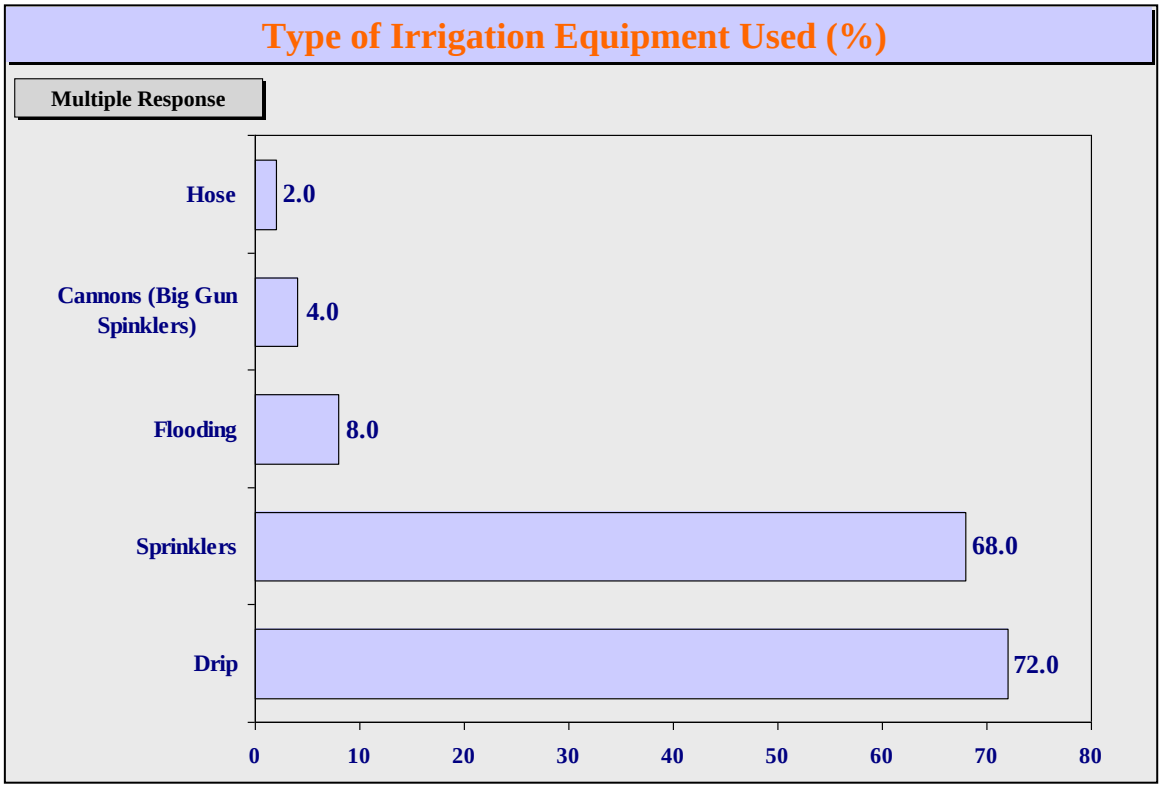
Setting up a model parcel under LRA control where specialized experts would work and show farmers effective irrigation practices, fertilizer application, and various agricultural practices.	6.0%	4.0%	4.0%	0%	4.0%	4.0%	4.0%	10.0%	82.0%	82.0%	100.0%

3.5. FARMERS' CHOICE OF IRRIGATION WATER SOURCE

3.5.1. TYPE OF IRRIGATION EQUIPMENT USED

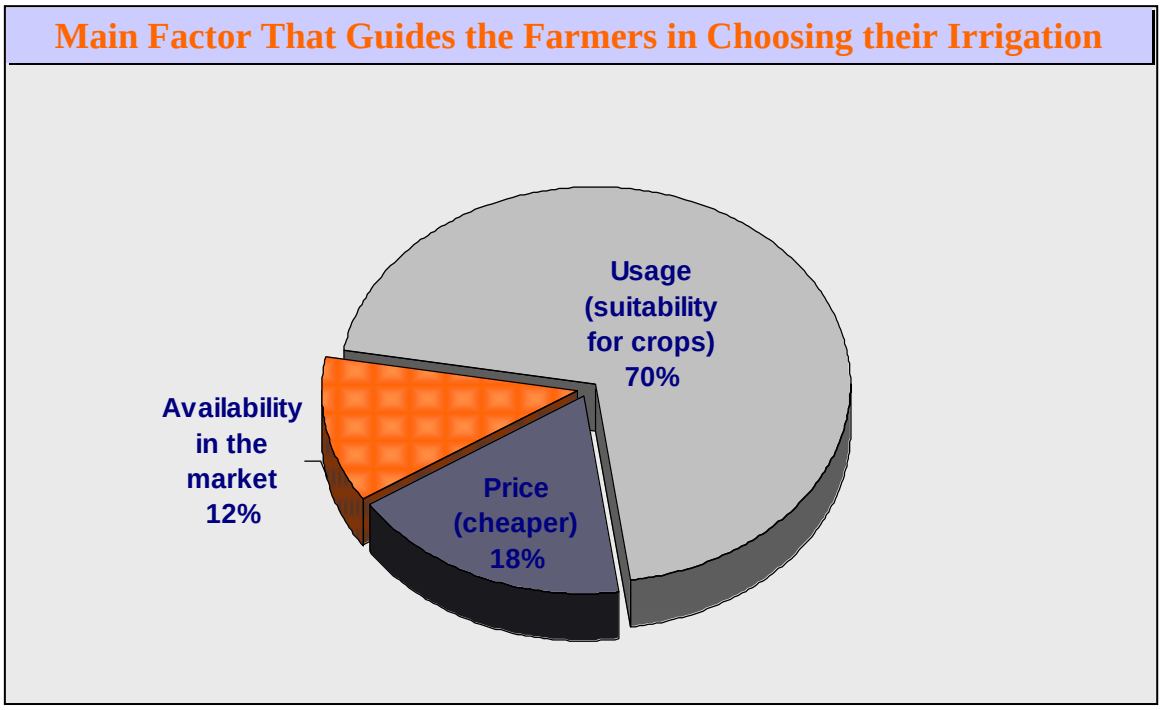
As demonstrated by the survey results, Drip (72%) and Sprinklers (68%) are by far the most used types of irrigation. They are used mostly by farmers with subscriptions to LRA; 88.9% of the Drip users, and 82.4% of the users of sprinklers. Only 8% still use surface irrigation such as flooding, 4% use cannons (big gun sprinklers) and 2% use hoses.

Graph 11: Type of Irrigation Equipment Used



The most important factor that guides the famers in their choice of irrigation type is its suitability for the various types of crops (70%), and to a much less extent, price and availability in the market (18% and 12% respectively).

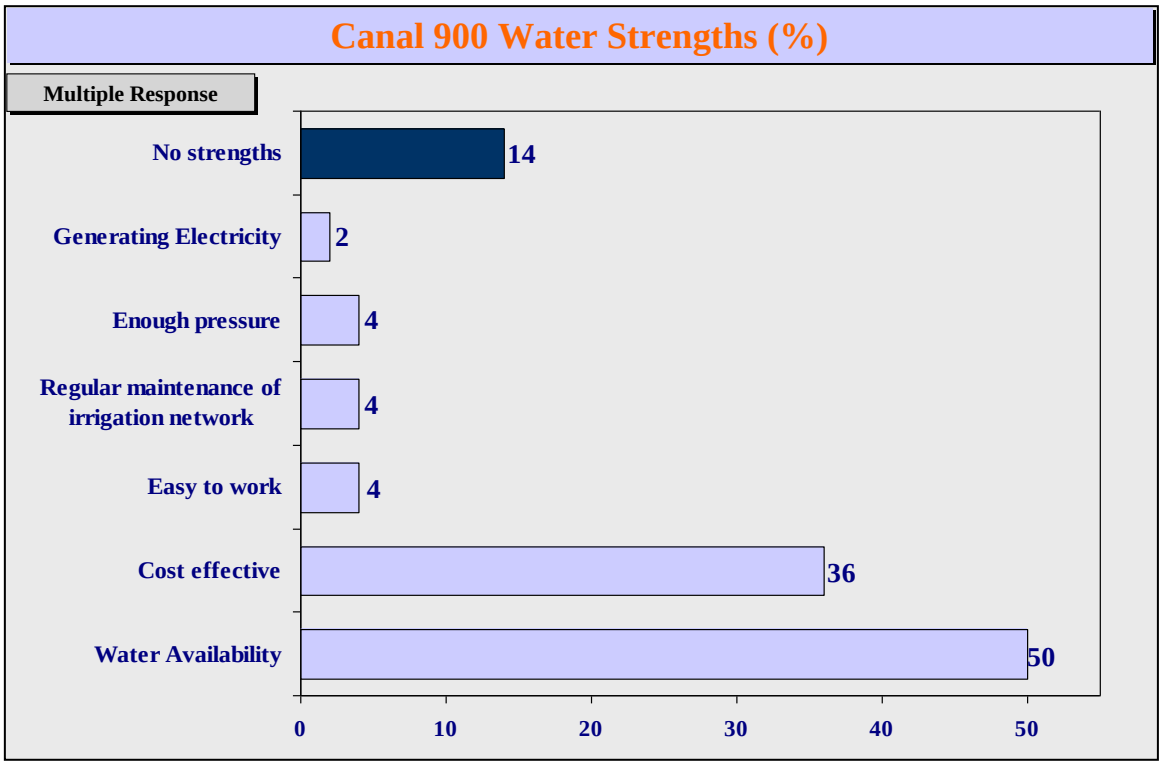
Graph 12: Main Factor That Guides the Farmers in Choosing their Irrigation Type



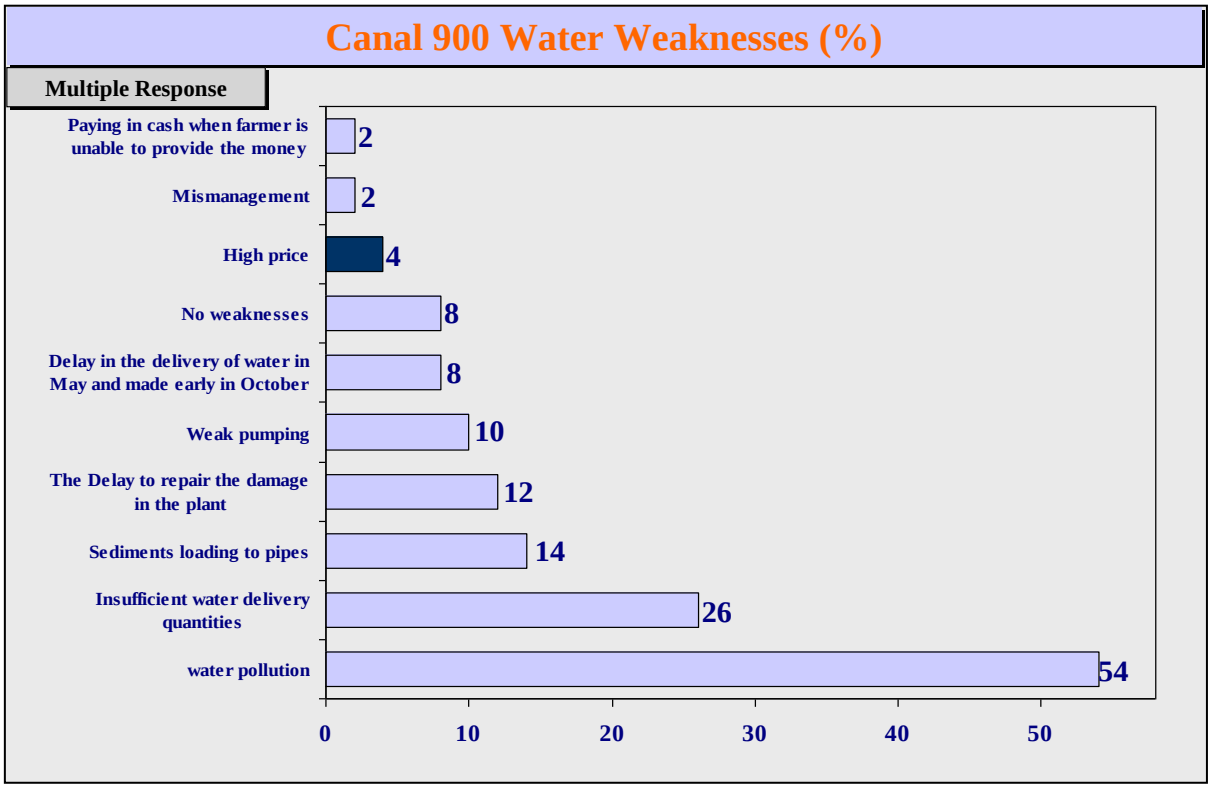
3.5.2. STRENGTHS AND WEAKNESSES OF DIFFERENT WATER SOURCES

Canal 900 water is reported to permanently have water available for 50% of farmers as well as being cost effective to 36% of them. However, its water is reported to be polluted (54%) and its amount/quantity delivered to be insufficient (26%). In addition, sediments in the water and blocking of the pipes were also a problem to 14% of farmers, as well as delays in repairing damage in the plant (12%).

Graph 13: Canal 900 Water Strengths

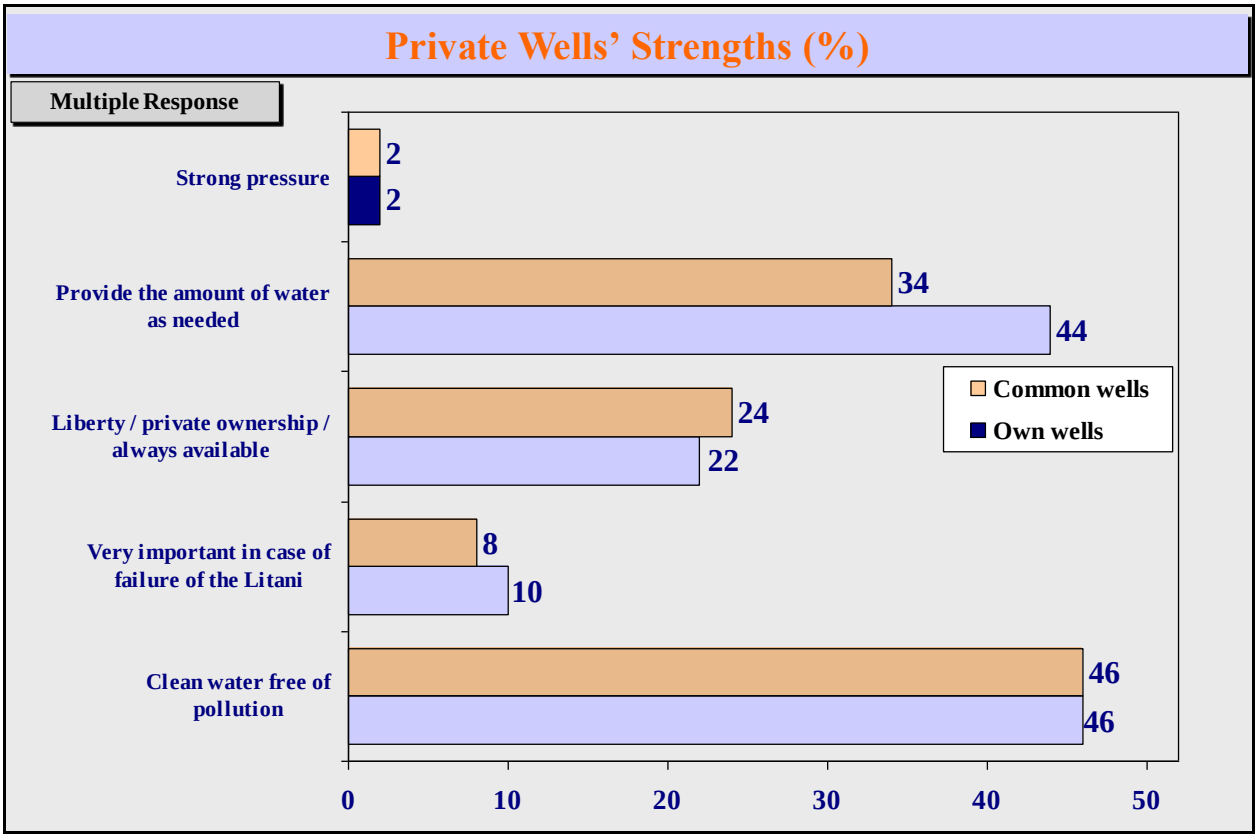


Graph 14: Canal 900 Water Weaknesses

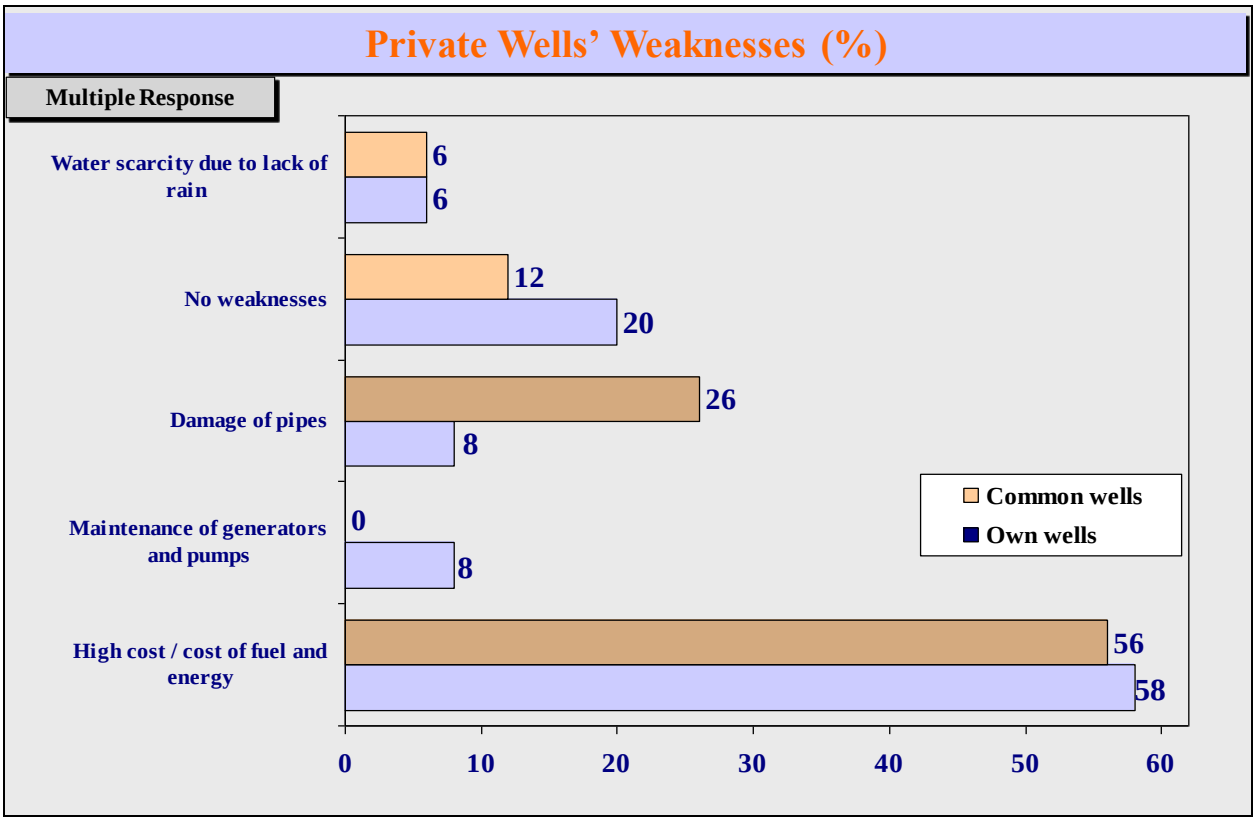


The main strength of private wells, whether owned or common wells, is that they provide clean non-polluted water (46% each), as well as providing the sufficient water amount needed by the farmers (44% and 34% respectively). However, private wells' main negative point is their pumping cost, where the price of fuel and energy needed for pumping from private wells is high (58% for own wells and 56% for common ones).

Graph 15: Private Wells Strengths



Graph 16: Private Wells Weaknesses



3.6. FARMERS' SATISFACTION WITH LRA SERVICES

In general, the selected subscribed farmers seem to be equally split between satisfied and dissatisfied with the overall services provided by the LRA (28.6% are extremely dissatisfied and another 28.6% are extremely satisfied). More precisely, 54.8% are dissatisfied (whether somehow or extremely) with the timing of LRA irrigation water but 50% are satisfied with the quantity of LRA irrigation water. In addition, the majority of farmers are satisfied with the quality of the LRA irrigation water as 21.4% are extremely satisfied and 31% are somewhat satisfied. But on the other hand, 26.2% remain extremely dissatisfied with this quality indicating considerable room for improvement.

The rate of satisfaction from LRA services differs from last year. In the 2011 survey, 69% of subscribed farmers reported to be satisfied with the overall LRA services and another 54.8% were satisfied with the timing of LRA irrigation water. The extent of dissatisfaction with the overall service of the LRA has increased since last year, indicating a possible problem with the provision of irrigation water that needs to be addressed urgently.

Table 20: Farmers' Satisfaction with LRA Services

	Extremely Dissatisfied			Somewhat Dissatisfied			Neutral			Somewhat Satisfied			Extremely satisfied			*Total*
	2012	**2011**	**2010**	**2012**	**2011**	**2010**	**2012**	**2011**	**2010**	**2012**	**2011**	**2010**	**2012**	**2011**	**2010**	
Quality of LRA Irrigation Water	26.2%	31.0%	29%	7.1%	16.7%	17%	14.3%	23.8%	38%	31.0%	19.0%	14%	21.4%	9.5%	2%	***100.0%***
Quantity of LRA Irrigation Water	19.0%	26.2%	33%	19.0%	14.3%	19%	11.9%	14.3%	14%	11.9%	9.5%	12%	38.1%	35.7%	21%	***100.0%***
Timing of LRA Irrigation Water	38.1%	26.2%	40%	16.7%	11.9%	19%	4.8%	7.1%	7%	9.5%	16.7%	19%	31.0%	38.1%	14%	***100.0%***
Overall LRA services	28.6%	7.1%	17%	14.3%	2.4%	5%	14.3%	21.4%	33%	14.3%	33.3%	29%	28.6%	35.7%	17%	***100.0%***

4. CONCLUSIONS AND RECOMMENDATIONS

Based on the above, the following conclusions and recommendations are drawn:

- The farmers seem to lack the conviction of the importance of cooperation with one another, and most of them believe they have the expertise to solve water-related problems. For this reason, the LRA could initiate a guidance program in cooperation with the Ministry of Agriculture or any other non-governmental organization that can persuade farmers to consider technical advice, share expertise, and realize the importance of agricultural co-operations.
- The Ministry of Agriculture should play an important role since the majority of farmers (84%) expect the extension services (advice on seeds, fertilizers, pesticides and cropping patterns) to be handled by the Ministry of Agriculture and related agencies, but the water distribution at system level and plot level to be handled mainly by LRA (54% and 54% respectively).
- The important role to be played by the Ministry of Agriculture and related organizations is underlined by the strong need of farmers to have regular lab soil, water and seeds analysis.
- Water pollution is among the major problems that the farmers are facing and it is of the utmost importance that this problem be solved by fighting the sources behind it.
- The irrigation time of the LRA water constituted an obstacle for 54.8% of farmers. Any steps considered to ameliorate the services provided by the LRA should take this into consideration, noting that the LRA is capable of presenting other technical solutions in this respect.
- Boosting communication and promoting ties between the farmers and the LRA is essential to resolving all the current conflicts between the two parties especially that 60% of the farmers asserted that they never receive any advice from the LRA. The relation must be treated as one between a service provider and a client, even if this provider was a governmental party and more effort should be put into gaining the trust and satisfaction of the farmers.

5. APPENDICES

5.1. APPENDIX A: QUESTIONNAIRE

Name: Town: Age:

Number of family workers: Number of permanent workers: Number of seasonal workers:

1. Do you have more than one holding?
   a. Yes
   b. No

2. Where do you get water for irrigation from?
   a. LRA
   b. Private Wells
   c. Other (please specify)

3. Please tell me where your holding(s) is(are) located, whether you own it or have leased it , how large is it, the number of irrigation hours per day, the quantity of irrigation water and the type of crops you plant:

a. For LRA Subscribers Hours of Irrigation Per day

Holding Number	Owned / Rented	Location (town)	Type of Soil (sandy, silty, clay)	Size	Hours of Irrigation /day	Water Pressure	Frequency of Irrigation per week	Type of crops

b. For Owners of Wells and Subscribers to Wells

Holding Number	Owned / Rented	Location (town)	Type of Soil (sandy, silty, clay)	Size	Hours of Irrigation / day	Water Pressure	Frequency of Irrigation per week	Type of crops

4. Please tell me whether your land yields one or two seasonal crops and what crops you plant in each season.

Holding Number	One season/ two seasons	Winter Crop	Summer Crop	Fall Crop

5. What type of irrigation do you use?

a. Sprinklers
b. Drip
c. Cannon
d. Flooding

5.1. What is the most important factor that guides you in choosing your irrigation type?

Price (cheaper)
Availability in the market
Usage (suitability for crops)

6. Please tell me what are the strong points and the weak points for the following water sources:

	LRA	Private Wells	Wells of Others
Strong Points			
Weak Points			

7. Please name the top two water-related problems you are facing today.

8. (For LRA Subscribers) On a scale of 1-5 where 5 is Extremely satisfied, 4 is Somewhat Satisfied, 3 is Neutral, 2 is Somewhat Dissatisfied, 1 is Extremely Dissatisfied, how do you feel about the following:

	5	4	3	2	1
Quality of LRA Irrigation Water					
Quantity of LRA Irrigation Water					
Timing of LRA Irrigation Water					
Overall LRA services					

9. (For private well owners/subscribers) On a scale of 1-5 where 5 is Extremely satisfied, 4 is Somewhat Satisfied, 3 is Neutral, 2 is Somewhat Dissatisfied, 1 is Extremely Dissatisfied, how do you feel about the following with regards to private well ownership and subscription:

	5	4	3	2	1
Quality of Irrigation water					
Quantity of Irrigation Water					
Timing of Water					
Overall services					

10. Which of the following statements do you agree with the most?

a. Water-related problems should be treated by the LRA
b. Water-related problems can be treated through better cooperation between the farmers and LRA
c. Water-related problems are the responsibility of the farmers
d. There are no water-related problems

11. How would you describe the fees you pay to LRA?

a. Over priced
b. Fair

c. Under priced

12. How often do you:

	Always (Daily)	Often (Once a week)	Sometimes (Once a month)	Rarely (Once a year)	Never
Receive Advice from LRA					
Receive explanations for sudden water shortage					
Get notified of prospective maintenance works					
Hold meetings with farmers to discuss various issues					
Compromise and make sacrifices for the sake of the general community					

13. Which of the following statements best describes your point of view?
   a. The maintenance carried out by the LRA is inadequate and untimely.
   b. The maintenance carried out by the LRA is properly scheduled and helpful

14. Which of the following statements best describes your point of view?
   a. The water network is strong and stable
   b. The water network is frail and cannot withstand pressure
   c. The water network could be stronger and more effective

15. Name two non water-related problems that in your opinion the LRA should handle.

16. (For LRA subscribers) If the LRA was willing to give irrigation water out of the regular times when rainfall is scarce, would you be willing to pay an extra amount of money for it?
   a. Yes
   b. No

17. With respect to the set-up of the way water is distributed over the holding, which of the following statements do you agree with the most?
   a. I have enough experience to decide how the water should be distributed over my holding
   b. I wouldn't mind receiving professional advice from LRA on how to set up the water distribution system on my holding

18. Which of the following statements do you agree with the most?
   a. Farmers cooperative is effective and guarantees the rights of the farmers.
   b. Farmers will not compromise for the sake of one another

19. When do you usually meet with LRA officials?

I meet with them at the LRA to pay my annual dues
I meet with them on my holding when there is a problem
I meet with them whenever the need arises
I don't meet with them at all

20. Please tell me how active are each of the following:

	Extremely Active	Somewhat Active	Somewhat Inactive	Extremely Inactive
Farmer Coop				
Government Agricultural Regional Centers				
Local / International Organizations				

21. With respect to the problem of water pollution, which of the following statements do you agree with the most?

The LRA is actively involved in limiting and controlling this problem
The LRA should be more active in controlling and solving the problem
The LRA is not dealing with the problem of pollution whatsoever
There is no pollution problem

22. For each activity in the following list, please tell who is currently performing it and who you think should be handling it:

Activity		LRA	Ministry of Agriculture & Extensions	Farmers	Ag. Assistants at shops	Farmer Associations
Extension Services (Advice on seeds, fertilizers, pesticides, cropping patterns)	Who handles this now?					
	Who should handle it?					
Water distribution at system level (canal 900 and Pump stations)	Who handles this now?					
	Who should handle it?					
Water distribution at plot level (rotation among farmers)	Who handles this now?					
	Who should handle it?					

23. On a scale of 1-5 where 5 is Extremely Necessary, 4 is Somewhat Necessary, 3 is In between, 2 is Somewhat unnecessary, 1 is Extremely unnecessary, please rate the need for the following:

	Extremely Necessary	Somewhat Necessary	In Between	Somewhat Unnecessary	Extremely Unnecessary
Regular Testing of seeds in Professional Labs					
Regular testing of the water in Professional Labs					
Regular testing of the soil in Professional Labs					
Testing the crop for quality and residues					
Setting up a model parcel under LRA control where specialized experts would work and show farmers effective irrigation practices, fertilizer application, and various agricultural practices.					

Farmers Comments and Notes:

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